

Exploring the Impact of Ecological Systems on the Research Performance of the Early Career Academics in Pakistan

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ABSTRACT

Universities play a vital role, by creating knowledge and imparting skills, moral values, ethics, and principles that promote sustainability, in society through research. However, returned early career academics (RECAs) face significant challenges in research due to ecological changes among region. This study aimed to explore the impact of ecological systems on the research performance of RECAs in Pakistan. This study implemented a qualitative research method and used an exploratory research design. A self-developed semi-structured interview protocol, based on Bronfenbrenner's Ecological Systems Theory, for returnees was designed to collect data from both genders the male and female faculty members at Lasbela University of Agriculture, Water and Marine Sciences (LUAWMS), Uthal, Balochistan, Pakistan. 23 participants, in their early career of 3-7 years after completion of Ph.D. and MS degrees from foreign countries, were purposively sampled. All the participants from different departments were interviewed face-to-face. Recorded interviews in audio form were transcribed into English and then analyzed by NVivo Software. Results highlighted undesirable effects of the ecological system: microsystem, exosystem, and macrosystem level factors on RECAs' research performance in the university. At the microsystem level, the study found participants' challenges in interacting with domestic colleagues, and at the exosystem level, the study found participants' challenges due to discrepancies between international and domestic institutional policies. At the level of the macrosystem, participants face challenges to re-adapt culture and re-integrate with domestic environmental components. Moreover, the study concludes by discussing the implications of these findings, acknowledging limitations, and providing future study suggestions.

Keywords: Ecological Systems; Impact; RECAs; Collaboration; Policies; Re-adaptation

INTRODUCTION

Universities play an important role in society by creating knowledge and imparting skills, moral values, ethics, and principles to promote sustainability in society. They consider themselves responsible for creating critical knowledge to benefit the ecosystems. In this regard, teaching and research are two dominant components of the universities to develop human capital resulting in societal development (Rasool & Dilshad, 2023). Therefore, researchers' international research mobility from developing

regions to developed ones has dramatically increased (OECD, 2007a) aiming to grow economic and educational growth, knowledge creation and expansion (Chen & Barnett, 2000).

This international research mobility and research collaboration benefits both the individual and his local regions by translating knowledge, skills, and innovative research techniques. These proficiencies might be access to technical equipment, local resources, raw information, and other aims of research (Georgiou, 1998). It results in advancement in career development, develops competitiveness globally, and, provides skills (Regets, 2007) to better perform and facilitate knowledge transmission and develop research output (Jonkers & Tijssen, 2008). Translating foreign skills and knowledge into domestic country grow society by developing human and social capital (Baker, 2015) and translates the foreign effective skills, advanced knowledge, and standards that result in productivity and prosperity into their local ecosystems. In addition, this scientific mobility grows social capital and social capital leads to collaborating scientists and ultimately, this networking benefits universities and society (Gureyev et al., 2020). Internationally trained scholars possess exceptional expertise in conducting research (Stephan & Levin, 2001) that fills the present aims of the universities and ultimately develop local communities.

However, foreign returnees may face numerous negative effects of foreign ecological systems on their research performance in the local environments (Ma & Pan, 2015) due to ecological changes among regions. For instance, they encounter challenges in making relationships with colleagues, navigating cultural diversity, re-adapting to domestic academic culture, and dealing with policies and political aspects of their community. Furthermore, researchers who have recently returned from studying abroad may experience contradictions with their homeland countries' ecological systems, as their previous experiences may differ from the human and social capitals (Wagner & Jonkers, 2017). Moreover, for RECAs, inadequate funding in the domestic institutions, as compared to international institutions, is among critical challenges (Winde et al., 2021). Administrative behaviors toward RECRs are a distractive aspect among the factors impacting their research performance (Sakurai, Pyhalto & Lindblom, 2012). The difference between international and local institutional policies, and the lack of interaction with local colleagues are the significant factors impacting RECAs in performing research in the local landscapes (Shumilova & Cai, 2015). In addition, reputation, independence, and sense of belonging as well as family and colleagueship are also influential factors leading to resistance in adjusting in the local environments (Kallio et al., 2024). The work environment (Shettima, John & Grace, 2024), particularly, to which RECAs are unfamiliar impacts their research performance (Sakurai & Mason, 2023). Consequently, these factors lead to challenges to interact with local colleagues, to re-adapt culture (Thuy, 2017), readjust in unfamiliar environments (Tijani, 2023), to implement foreign-gained knowledge, research skills and techniques in the local environments (Shinkafi, 2020). Correspondingly, Pakistan also receives foreign returnees re-integrating with their local higher education systems (Higher Education Commission 2013) who face the similar influential factors (Ahmed et. al., 2023) such as, colleagues' biasedness toward ECAs (Shah, Bashir & Amin, 2020), difficulties in re-adjustment to balance themselves with institutions (Ahmed et al., 2024) and lack of funding for research (Gorard & Siddiqui, 2024). If these factors are addressed, the unexperienced RECAs in the new research environment become independent researchers and consequentially bring lasting innovation in the research disciplines developing ecosystems (Eurodoc, 2017; Faridah et al., 2021). Contradiction to resolving their obstacles, result in weakening and diminishing their foreign-gained research skills, techniques, and knowledge over time (Shinkafi, 2020).

To figure out the influential factors, the existing study filled a critical research gap highlighted in the literature by Zhao et al. (2021) that remained unexplored in the context of Pakistan. To bridge this gap, the following research questions were developed based on Bronfenbrenner's Ecological Systems Theory:

- **Research question 1:** How does interaction with national colleagues (experience, knowledge, and research skills) affect RECA's research performance in universities in Pakistan?
- **Research question 2:** What is the effect of the institutional pattern (institutional disciplines) on RECA's research performance in universities in Pakistan?
- **Research question 3:** How do cultural factors (language, tradition, religion) affect RECA's research performance in universities in Pakistan?

To address these research questions, RECA's lived experiences were examined who were presently engaged in research activities in Lasbela University of Agriculture, Water and Marine Sciences (LUAWMS), Uthal, Balochistan, Pakistan.

LITERATURE REVIEW

Historically, mobility to study in international countries is drawn back to around 300 BC when Greek scholars crossed borders and traveled to Alexandria for learning (Jalowiecki & Gorzelak, 2004). Basically, scientific research mobility moves from developing countries to developed ones (Schartner et al., 2023). Since then, mobility for learning persists to get academic support from developed countries to prosper their domestic regions and its consequences are also mirrored across the world (Lee et al., 2006). Due to the importance of research mobility, Indonesia has increased doctoral degree holders by training them in international prestigious universities to achieve competitive doctoral degree holders. In their career and social development, returnees have an effective contribution to their local institutions. Enormously skilled human capital from international mobilization is a strong capacity of concentration for scientists in recent years. For them, staying abroad is a central part of their academic career (Teichler, 2017). Due to such importance of foreign studies, the countries that used to send scholars overseas, now those are recipients (Seggie & Calikoglu, 2023).

Over the past ten years, Indonesia highly invested on international research training and schemes to facilitate traveling for doctoral degree holders in the top two hundred universities in different countries (Bhatt & Samanhudi, 2022). Similarly, over the past five years, there has been a 3% increase in the number of Japanese researchers holding international degrees (Yonezawa et al., 2013). Moreover, the returned scholars to Japan with PhDs are yet aligned with and continue to collaborate with colleagues living abroad, resulting in effective research performance (Li et al., 2024). However, those who do not have networking with foreign colleagues, perform lower in research (Franzoni, Scellato & Stephan, 2018). Mexico likes to send students abroad for quality education instead of receiving foreign scholars (Cantwell et al., 2009). Similarly, in China, more than five million Chinese academics traveled abroad by 2007, with over three million returnees. In addition, Japan has increased the hiring of international scholars (Chen, 2022). Moreover, Chinese universities have established sustainable goals, encouraging early-career academics to publish more papers both domestically and internationally (Chen & Pang, 2022). Alike these countries, Vietnam has also initiated various projects to increase researchers' international mobility to improve research performance through various funding strategies including the National Foundation for Science and Technology Development (Nguyen & Klopfer, 2019).

Moreover, to gain a better understanding of how ecological factors affect returned academics' research performance, several studies have been conducted in different regions, focusing on individual development within the research environment. Regarding this, the existing study used three dimensions (microsystem, exosystem, macrosystem) of Bronfenbrenner's EST to explore the impact of ecological systems on the RECA's research performance in Lasbela University of Agriculture, Water and Marine Sciences (LUAWMS), Uthal, Balochistan, Pakistan.

Impact of Microsystem on the Returned ECAs' Research Performance

The microsystem is the closest layer of the individuals' immediate living environment consisting of family and colleagues' interaction which directly impacts the individuals' performance (Ryan, 2001). When scholars live abroad in developed countries, they gain international interaction at the microsystem level that allows them to access skills and knowledge from colleagues who differ from domestic countries (De Clercq et al., 2012). Returnees come back with authentic knowledge and new experiences gained from developed countries (Guruz, 2011) but due to differences in ecological systems between foreign and domestic country, their performance is impacted (Mittelmeier et al., 2022).

Literature shows various microsystem-related factors that impact RECA's research performance in domestic countries. About this, a study in Singapore, conducted by Wang et al. (2019) discovered that researchers who returned from overseas, have a low level of interaction with domestic colleagues. In the beginning, they have good collaboration but over time, this collaboration declines. The study evidenced that returned scholars have a low level of interaction with local colleagues that negatively impacts their research performance in domestic institutions. Similarly, when Jewish scientists returned from Russia to their domestic country, their research output declined (Borjas et al., 2015). Lee and Kim (2010) found that Korean foreign-educated scholars who returned from the USA faced challenges interacting with domestic systems. Moreover, McAlpine and Amundsen (2015) found that early career researchers face several issues including day-to-day and long-term challenges. ECRs feel frustrated with new colleagues to discuss their day-to-day issues and they also are dissatisfied with the institutional environment in which they are not getting adjusted due to the changes of the environment in which they previously lived in the host country. In Australia, Christian et al. (2021), in a survey study, found that half of the respondents expressed dissatisfaction due to a lack of collaboration with institutional stakeholders.

Young et al. (2019) examined the work environment and impact of collaborative work on research performance in Vietnam. They found that Vietnamese researchers have higher research productivity and publications with foreign colleagues as compared to local peers in Vietnam. This evidenced that foreign colleagues are more supportive in research activities with returned academics contrasting to domestic colleagues. Wood (1990) found the factors influencing returned academic research performance was the lack of support provided by domestic colleagues in local institutions. Winter and Sarros (2002) conducted a survey study in eight Australian universities to examine the impact of microsystems-level factors including immediate work environment on faculties' performance. By collecting data from 1041 participants among 2630 of the total population, the study concluded that participants were satisfied with some factors (domestic academics' behavior and attitude) of the work environment. However, they were dissatisfied with the immediate environment due to facing pressure in working. Kuzhabekova et al. (2019) interviewed RECA's to explore the impact of microsystems on their research performance in Kazakhstan. They found several factors constraining RECA's in universities. They faced challenges in accessing domestic scholarly colleagues, dominated by senior academics, administrative challenges, difficulties in exchanging knowledge and skills learned from abroad, academics' support in research, and limited access to research resources.

Similarly, Chen and Li (2020), by interviewing fifteen returned academics in two Chinese research universities, explored the impact of the domestic institutional immediate environment on their satisfaction. Study highlighted various challenges of domestic institutional environment on the early career researchers. These constraining factors included resistance to interact with domestic colleagues, unsupportive local institutional culture dissimilar to the host country, and lack of open traditions in the domestic institutions. In the U.S, Bookman (2020) explored the live experiences of foreign returned scholars from California. The study concluded that returned academics in the U.S have varied

observations regarding the institution, colleagues, surroundings, and collaboration with domestics. The study indicated that the returned scholars feel isolated due to the difference between the overseas and domestic life patterns people and meaningless relationships with domestic colleagues. Similarly, in a study, Collins (2008) identified various factors impacting returned academics in the U.S. The study identified that the returned academics feel isolated as they do not have proper and meaningful interaction with domestic scholars. Contrary, Kartoshkina (2015) found no difficulties of the foreign educated scholars in the U.S interacting with their domestic colleagues. Their reentry experiences from overseas with domestic colleagues were positive. Thus, found that people returning from foreign studies have mixed experiences of positive and negative regarding domestic colleagues' interaction.

A survey study in Punjab district, Pakistan, found significant factors impacting foreign returnees' research performance in Pakistan. They included difficulties in implementing foreign acquired research skills in domestic institutions, lack of effective collaboration with domestic colleagues, and funding opportunities to balance research work and enhance international research collaboration (Azeem & Aslam, 2024). Similar to this, Sabah et al. (2019) sought to investigate the impact of international collaboration on academic's research performance in Pakistan. The findings revealed a positive correlation between international scientific collaboration and domestic research performance.

Impact of Exosystem on the RECA's Research Performance

The Exosystem is the higher collective system in which an individual has no direct interaction with environmental components but still his performance is impacted by several social contingencies including institutional policies, political rules and regulations, and economic factors (Ryan, 2001). It is the system in which individuals do not have active participation in activities but the time spent in the environment, in which they live, have an indirect effect on their performance (Rosa & Tudge, 2013). Accordingly, researchers face challenges of exosystem when they are in their early career in an institution. They have difficulty finding scientific approaches due to unfamiliarity with the new environment (Da Silva, 2021). In addition, the resources and institutional policies surrounding individuals in the institution, indirectly impact the credibility of their research performance (Zhao et al., 2022). The provision of funding levels for the research also impacts the research performance of the individuals (Roje et al., 2023). Additionally, for the research scholars who return from overseas to domestic institutions, their research performance is significantly impacted when interacting with an affected environment that has no research culture, lack of resources for research, economic factors, and as well as institutional patterns that differ from their host countries' institutional policies (Lowe et al., 2009). Human performance in an environment is affected by human productivity such as political viewpoints, policies, and economic factors. Similarly, Creswell (1985) added that an institution's environmental beliefs, rules, policies, values, and content significantly impact the research performance of academics.

Upon completing their Master and Doctoral degrees, scholars who return to their national universities often exhibit different performance levels compared to those who obtained degrees within their domestic country. According to Memoni et al. (2022) the performance of returnees can be either positively or negatively affected by social contingencies. In this sense, Sulo et al. (2012) identified the significant factors which impact academics' research performance in Kenya. They found that social contingencies within the research environment can shape the outcomes of research endeavors. Lertputtarak (2008) found that factors that hindered research performance at Hahidol University were institutional policies. Relatively, a study conducted in Dubai by Wilkins and Neri (2019) aimed to explore foreign academics' work experiences, their collaboration work with domestics, and job satisfaction. The study found that participants showed satisfaction with their job while some of them indicated issues working in collaboration with their domestic colleagues. The responsible factors were

highlighted including institutional policies, objectives, values and local cultural dimensions. In another study, Aydin (2017) found that resources availability such as library and research funding and appropriate research environment affect the research performance of researchers in higher education.

In addition, Hoffmann et al. (2017) added that research assistance and time spent on research affect the academics' research performance. Lertputtarak (2008), in Thailand, found a positive correlation between research performance and the amount of time spent on research as well as the researcher's environment. Similarly, Bentley and Kyvik (2013) conducted a study in Malaysia, Argentina, Brazil, Finland, Italy, Germany, Canada, and China to explore the factors influencing academics' research performance. The study discovered that regions where more time is dedicated to research tend to have higher research performance. By collecting data from Chinese elite universities (Beijing & Shanghai), the study found a positive correlation between time spent in the host country to gain experiences and international co-publication with foreign colleagues. The findings of the study indicated the positive impact of time spent in the host country and the support of foreign colleagues on returned academic research performance. The time spent in host countries helped participants gain social capital contributing to international co-publications (Wang et al., 2011).

Additionally, the performance of academics and their collaboration with others in research are influenced not only by their research experience and skills but also by their interactions with individuals possessing different professional and technical knowledge in the research field (Bozeman et al., 2001). Chinese researchers found that studying abroad can impact the perspective of individuals returning to work in their home country due to the exchange of ideas and experiences (Jonkers & Tijssen, 2008). Thus, RECAs often find it challenging to adapt to a new institutional environment, especially if they have previously experienced different situations. This can hinder their ability to perform well, both in terms of administrative tasks at their home institution and conducting high-quality international research. To improve their research capabilities, early career academics who have returned from abroad need time to adjust to their new work environment. Several studies (Jonkers & Tijssen, 2008; Li et al., 2024; Melin, 2005) have emphasized the importance of this adjustment period. Moreover, international institutional policies and other contextual factors significantly impact returned academic research performance in the domestic country. In this regard, Tran et al. (2022) conducted a qualitative research study to explore Vietnamese graduates' perceptions of the impacts of contextual factors on their decision to return home from Australia. The study found that international institutional policies significantly impacted their research performance in their domestic countries as they were dissimilar contrasting with the scholars' previous experiences in the host country.

Impact of Macrosystem on the RECAs' Research Performance

The macrosystem is the environmental layer that contains the relationship of an individual with the cultures, customs, and norms which surround the individual. This layer encompasses cultural values, religious characteristics, languages, and other social norms (Ryan, 2001). In the higher education sector, researchers' environment is shaped by the culture of institutions with various departments having people of different cultures, religions, traditions, and life-patterns (Gallardo, 2021) that can impact researchers' performance (Kwiek & Roszka 2022). Broadly, macrosystem is a system of institutional rules, economy and political system, and ideology on which the country is based (Rosa & Tudge 2013). It is the holistic societal pattern in which an individual lives and develops (Christensen, 2016). The environment, in which an institution functions, is surrounded by various social and cultural systems. As the institution is affected by the ecological factors, when an individual engages in the institution, his output and responsibilities too are affected by the ecological systems (Gleim et al., 2019).

According to Wilkins and Neri (2019), when scholars return from foreign countries to their domestic countries, their work performance is affected by various ecological factors but most particularly by cultural aspects. Language is also one of the significant factors that affect academics' performance (Gahungu, 2011; Yudkevich, 2016). Similarly, Froese (2012) found that collectively culture and language both significantly affect foreign-educated academics' social and professional ability to perform efficiently in their domestic countries. Host countries' cultures and languages have a significant impact on returned academics' performance in domestic institutions. Persisting this, some researchers have identified that returnees have immensely been appreciated by the joined organization in their native country due to the effective association they gained internationally and experienced ecological systems while aligning with overseas cultures (Froese, 2012; Gahungu, 2011; Li & Xue, 2021). However, some studies have shown the opposite of this notion (Monene, 2014) due to cultural and language differences between host and domestic countries (Collins, 2008; Yudkevich, 2016). Thi et al (2021) explored the live experiences of the Vietnamese returned research scholars' experiences in their domestic country. The study concluded that they, upon their re-engagement, faced various challenges including time constraints, instructional workload and lack of resources as key factors. Shin et al. (2014) found that returned academics in Malaysia, Hong Kong, and Korea do not show more efficiency related to research performance compared to domestic scholars due to foreign exposure.

However, in Japan, Chen (2022) found that cultural and environmental factors hindered returned scholars' working interests as they integrated with Japanese universities. Chang (2010) found that foreign cultures impacted the positive interaction of foreign returnees with domestic cultures. Similarly, when foreign-educated scholars return to their home countries, they also feel loneliness due to spending a significant amount of time away from their domestic ecosystems (Jonkers & Tijssen, 2008). They cannot work favorably in their domestic institutions due to differences in institutional hierarchies and authority of power, freedom level, and favoritism between host and domestic countries (Marginson, 2014). Chiang and Liao (2008) explored the impact of cultural re-adaptation impacts on returned academics identity and their interaction with the local community in Australia. Concluded that the foreign culture impacted the returnees' interaction with domestics and foreign ecological factors caused challenges to re-adapt the pure domestic cultures.

In addition, returned academics face dramatic challenges regarding knowledge transferring into domestic institutions due to lack of positive interaction with research colleagues, staff, and students. Also, these factors consist of receivers' inability to basic knowledge, resources to support knowledge transfer, and returnees' lack of interaction with domestic people and traditions (Szulanski, 2000; Liyanage et al., 2009). In this sense, Thuy (2017) conducted a study in Vietnam aiming to explore the international institutional policies impacting returned academics' knowledge transfer in domestic institutions. By implementing a qualitative research approach, conducting interviews with sixteen returnees found that returnees can only share explicit knowledge with domestic colleagues. However, tacit knowledge and skills transformation into a domestic institution was difficult for returnees due to differences between the policies of the host and domestic institutions. In addition, the study found various influential factors hindering returnees from transferring knowledge. These factors included differences in human resource capital between the host and domestic country, strong values of hierarchy, defined roles between academics and managerial staff, lack of shared mindsets, and traditional thinking capacity of the local people. In addition, the study found that due to such challenges, the returned academics face several in implementing foreign-learned research skills, knowledge and methodologies into their domestic institutions.

Additionally, Li et al. (2024) explored the domestic ecological factors (cultural, economic, and political factors) impacting RECA's research performance in China. The study found very significant influential factors impacting RECA's research performance in Chinese research universities including an

imbalance in teaching and research performance in domestic institutions, securing research projects to enhance research performance and a lack of an institutional supportive system regarding research performance. Moreover, returnees face various challenges regarding reintegrating into domestic cultures after living in international cultures (Hao et al., 2016; Szkudlarek, 2010). In this regard, Haryaba et al. (2013) conducted a qualitative case study in an Australian university to investigate the returned academics perceptions regarding offering support services and the impact of cultural re-adaptation on their performance. The study found that returned academics face various challenges to re-adapt domestic cultures and languages. In Thailand, Schartner et al., (2023) examined the work adjustment experiences of foreign educated academics in higher educational institutions. The study found that participants were psychologically unhappy to work in Thailand due to lack of institutional support in their working area.

According to the literature, the research performance of returnees is significantly influenced by various ecological factors, including the microsystem, exosystem, and macrosystem. As evidenced by Billett (2001) that ecological systems have a natural tendency that influences the extent to which an individual is engaged. Ecological systems influence the scope to which one desires to work (McAipine et al., 2013). Similarly, various studies explored the impact of ecological systems on the research performance of RECAs in domestic countries in diverse settings (Cantwell, 2009) in terms of worthiness (Shirinsefat, 2015) and deceptiveness (Momeni et al., 2022). Some scholars examined the impact of ecological systems on returnees' academic performance while reintegration and re-adaptation into domestic countries (Chang, 2010; Chiang & Liao, 2008; Kartoshkina, 2015; Ma & Pan, 2015). Similarly, some studies explored the impact of scholars' work environment (Johnsrud & Rosser, 2002; Meara, Lounder & Campbell, 2014) and the impact of cultural values on the research performance (Ghafoor & Naz, 2024). It is evidenced by the literature that these ecological factors can have both positive and negative effects on the research performance of early-career academics who have returned from abroad. To explore the factors and provide guidance to the academics at the early stage of their career is vital in shaping the development of the academics in the institution (Wróblewska et al., 2024).

METHODS

Research Framework

This study aimed to explore the impact of ecological systems on the returned early career academics' research performance in Pakistan by following Bronfenbrenner's Ecological Systems Theory (EST) as research framework. A growing literature proposed the application of EST to integrate it comprehensively in higher education to explore the impact of ecological changes on academics' research performance (Peng, 2020; Zhao et. al., 2021) and learning experiences (Graham et al., 2023; Li & Xue, 2021). It is indispensable to explore the effects of social contingencies including ideology, interaction with environments, economic, cultural, demographic, and religious factors on human development (Eriksson, Ghazinour & Hammarström, 2018; Ghafoor, Khan & Ullah, 2025). The theory defines performance as the consequence of human interaction with a system (ecology) and subsystems (micr, exo, macro, meso, and chronosystem). However, this study excluded mesosystem and chronosystem due to their irrelevancy in the context of the study (Zhao et al., 2021). Therefore, this study implemented three dimensions of Bronfenbrenner's EST (Figure 1) to explore lived experiences of RECAs' at Lasbela University of Agriculture, Water and Marine Sciences (LUAWMS), Uthal, Blochistan, Pakistan.

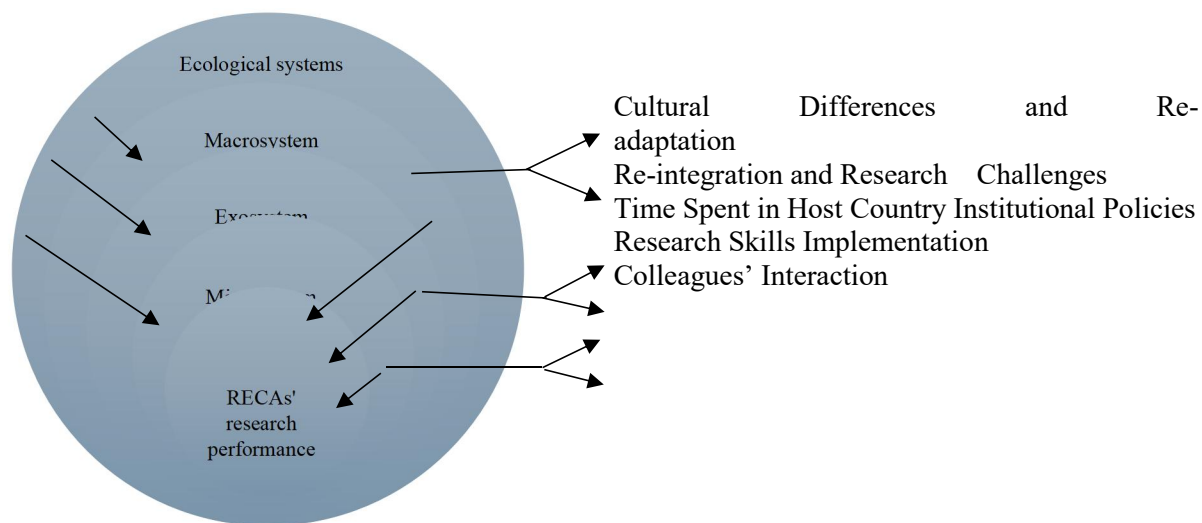


Figure.1 Bronfenbrenner's Ecological Systems Theory

Research Paradigm and Methodology

Philosophically, the study based on constructivism paradigm aiming to construct reality and novel knowledge through individual experiences (Armstrong & Armstrong, 2013). The study adopted a constructivist ontology to ensure that reality is constructed through individual experiences. Moreover, an exploratory qualitative research method was used to explore the meaning of an event as experienced (Levitt et al., 2017) by RECA's through studying a sample (Punch, 2013). Exploratory research design helped to explore new and interesting perceptions on live events (Swedberg, 2020) of the RECA's in the university.

Data Collection and Procedures

A self-developed semi-structured interview protocol for returnees (SSIP-R), guided by Bronfenbrenner's EST (Ahmed et. al., 2024), was implemented to collect data. Both, the English and Urdu versions SSIP were distributed, along with consent informed form for the assurance of transparent and impartial findings (Knottnerus & Tugwell, 2018), among a total of n=25 RECA's. Hence, providing consent informed form acknowledged participants about research objectives and confirmed the selection criteria for sampling and acknowledged participants about their confidentiality. In this way, the interviewer committed to upholding and implementing ethical considerations throughout this study (Almaghrabi et al., 2024).

The participants were purposively sampled. For example, interviewees should include having research experiences of 3-7 years. Secondly, the participants must involve in research activities. Thirdly, the interviewees must obtained their Master or Ph.D. degrees from foreign countries (Table 1.). These selected participants were accessed through snowballing technique as they were hidden in different departments having similar characteristics that the study required (Parker, Scott & Geddes, 2019). Before starting interviews, the researcher introduced the research topic and motivated participants toward interview (Karunarathna et al., 2024).

A total of n=25 participants were individually interviewed on their own given time in different languages according to their preferences (Baloch et al., 2021) such as English, Urdu, and Balochi language. However, two selected participants' interviews, among 25, were disregarded due to unmeet of the selection criteria. While interviewing, the interviewer possessed a list of the questions relevant to the objectives of the study but didn't ask all the similar questions as written in SSIP (Gray & Gray, 2009), however, considered the concept of the questions. Interviews' audio recording was preferred over recording videos and writing texts at the time of interviewing (Gibbons et al., 2016). Later, recordings were transcribed into English for analysis. Before data analysis, recordings and transcriptions were member-checked by participants to see the validity and increase the trustworthiness of the study and confidentiality of the participants (Birt et al., 2016).

Data Analysis

Analyst used deductive data analysis technique to get specific information from general collected data (Soiferman, 2010). Deductive analysis provided a comprehensive data analysis technique in order to make sense from whole data (Azungah, 2008). Before analysis, the whole interview transcriptions were summarized and read many times to get well understanding of the data. Then, analyst used Nvivo V.14 Software which is helpful to store, manage, and analyze qualitative data (Jackson, Bazeley & Bazeley, 2019) contrary to SPSS used to display numerical statistics (Najeeb et al., 2021). Afterward, the data analyst did an open coding process which helped better understand the data similarities and differences. From nodding, various open codes emerged from the excerpts. For getting axial codes, the open codes were categorized to find themes (Cresswell, 2013). However, data analyst already had some main themes on the basis of theoretical framework. Based on the epistemology of the data analysis technique, analyst used some pre-specified themes when using Nvivo (Elliott, 2018). Coding process was done separately for each question and its sub-questions relating to the themes such as microsystem, exosystem, and macrosystem.

Table 1: Demographic information of participants

S.No	Gender	Age	Region of study	Ranking	Department	Qualification
1	Male	35	Brazil	Assi Prof	Agriculture	Ph.D.
2	Male	37	China	Assi Prof	Agriculture	Ph.D.
3	Male	39	China	Assi Prof	I.R	Ph.D.
4	Male	37	China	Assi Prof	Agriculture	Ph.D.
5	Male	38	China	Assi Prof	Animal Sciences	Ph.D.
6	Male	43	China	Assi Prof	Agriculture	Ph.D.
7	Male	41	China	Assi Prof	Agriculture	Ph.D.
8	Male	44	China	Professor	Animal Sciences	Ph.D.
9	Male	45	China	Professor	Animal Sciences	Ph.D.
10	Male	53	New Zealand	Professor	Agriculture	Ph.D.
11	Female	46	China	Assi Prof	Animal Sciences	Ph.D.
12	Male	31	Malaysia	Lecturer	Animal Sciences	M.S.
13	Male	40	China	Assi Prof	Animal Sciences	Ph.D.
14	Male	43	Malaysia	Professor	Animal Sciences	Ph.D.
15	Male	48	China	Professor	Marine Sciences	Ph.D.
16	Male	40	China	Chairman	Marine Sciences	Ph.D.
17	Male	41	China	Assi Prof	Biological Sciences	Ph.D.
18	Male	37	France	Assi Prof	Marine Sciences	Ph.D.
19	Male	37	China	Assi Prof	Marine Sciences	Ph.D.

20	Male	37	Malaysia	Assi Prof	Environmental Sci	Ph.D.
21	Male	34	Malaysia	Lecturer	Environmental Sci	M.S.
22	Male	41	China	Asso Pro	Environmental Sci	Ph.D.
23	Male	41	China	Assi Prof	Education	Ph.D.

Note: Assi Prof; (Assistant Professor), Asso Pro; (Associative Professor), Sci; (Sciences), I.R.; (International Relationship).

RESULTS

The results of the study are displayed based on the research questions relating with dimensions of the theoretical framework. The results of each system are presented distinctly to show how RECA's research performance is impacted by different ecological systems such as microsystem, exosystem and macrosystem.

Microsystem-Level Perceptions

Interaction with Foreign Colleagues

The majority of the interviewees explained that they had/have a good collaboration with their foreign colleagues. By emphasizing the positive interaction of foreign colleagues, particularly collaboration and knowledge sharing, they narrated as following:

I had a very positive experience with my foreign colleagues. They always cooperated with my research. They continue to have a positive influence on my research in Pakistan, and our joint efforts have led to successful project opportunities. (Interviewee 2)

Similarly, an Assistant Professor, returned from China, appreciated the collaboration of the foreign colleagues very valuable on his research performance. His focus of work shifted to the research and project hunting. After return, he achieved funds from the Pakistan Science Foundation and HEC. Foreign colleagues' collaboration helped him to establish a conducive learning environment in the local university. He stated that:

After completing my Ph.D., my primary focus shifted to research activities and securing projects. I've successfully collaborated with foreign colleagues to secure projects and also received funding from Pakistan Science Foundation and Higher Education Commission (HEC). These collaborations have enabled me to establish a conducive research environment in my department, aiming to uplift the university's standards. With a focus on publications and mentoring MS students in research, I'm working to create an environment akin to advanced countries, facilitated by the ongoing collaboration and support from my foreign colleagues. (Interviewee 6)

Moreover, another interviewee stated by appreciating his foreign colleagues' collaboration in his particular field, animal sciences. He obtained a positive experience working with his foreign colleagues. He narrated that his foreign colleagues still have a strong collaboration with his research work and support him after completing his Ph.D. from overseas. He narrated that:

My foreign colleagues and professors were extremely helpful and cooperative during my research in applied sciences, particularly in animal sciences and vaccination design. They assisted me in designing experiments and collaborated closely due to the interconnected nature of our projects. I had a fantastic

experience working with them, impressed by their honesty, dedication, and strong work ethic. Even after completing my research, they continue to support and respond to my requests for help. (Interviewee 9)

Another interviewee Professor, returned from the interaction of his Malaysian colleagues showed positive impact of his foreign colleagues on his research in Pakistan. He acquired a significant knowledge from the collaboration of his foreign colleagues. In addition, his foreign colleagues supported him by providing equipment while his stay abroad for conducting research. He described that:

My colleagues of foreign country have a significant positive impact on my research in Pakistan by exchange of knowledge, collaboration and access to resources. During my doctorate study, I had many friends belonged to Malaysia, China, India, Nigeria, Iraq and Iran etcetera who were well qualified and professional. Their collaboration regarding my research was very efficacious. Secondly, during collaboration with Malaysian and foreign colleagues, they provided me specialized equipment, data base and experts in different areas that were crucial parts of research projects. (Interviewee 14)

Similarly, another Assistant Professor returning from Malaysia encouraged his foreign colleagues' collaboration on his research publication productivity. They co-authored each other in their published papers. He stated in the following way:

Contribution and linkage with foreign colleagues was very impressive. Collaboration regarding research was very coordinated. They helped in paper publication. They contributed very politely in our research publication and drafting research. They helped me to modify my work. We used to include their names in our papers and they used to include our names in their papers for publication. I have published nearly 8-10 papers with my Nigerian colleagues. It is a big collaboration. (Interviewee 20)

In addition, an Assistant professor returned from China argued that his foreign colleagues still have collaboration in his research. He appreciated his foreign colleagues' positive impact by describing his help in data analysis. He stated that:

If you talk about the colleagues, so, my international (Chinese) colleagues immensely support me. Either they are teachers, senior or junior. I can exemplify this that I had a Chinese colleague who supported me a lot especially in my research data analysis. And still I have interaction with my foreign colleagues. (Interviewee 23)

Similarly, some interviewees appreciated the foreign colleagues' collaboration very valuable in terms of improving their professional development. They narrated as:

They were truthful. There was reality between friends. They influenced me to be punctual with my work. (Interviewee 1)

Since returning to Pakistan in 2019 after my stay in foreign country (France), I have been working at this university, where my foreign colleagues' advanced-level work has significantly influenced me. Inspired by their expertise, I strive to establish similar high standards in my research here, aiming to bridge the gap and elevate the quality of work in my institution. (Interviewee 18)

Interacting with colleagues from foreign countries significantly enhance my research performance in Pakistan. We have interactions through online, through zoom meetings and different kinds of interaction we have. I am getting more knowledge from them in diverse perspectives especially in research categories, methodologies, and innovative ideas. (Interviewee 22)

Moreover, admiring the positive impact of interaction on their research performance, one interviewee valued foreign colleagues' interaction regarding networking and support by addressing:

Interacting with colleagues from foreign countries has enhanced my research performance in Pakistan by broadening my perspective. One specific example of collaboration resulting from international interactions is my agreement with the China Ocean Development Foundation on Marine Spatial Planning. This partnership has led to joint research projects, sharing of data and resources, and the development of innovative strategies for sustainable marine resource management, significantly enhancing the scope and impact of my work in Pakistan. (Interviewee 19)

Additionally, concerned with language support, one participant narrated clearly admiring foreign colleagues' collaboration regarding research. His professor/ supervisor mandated his colleagues to always support him in his research work. He quoted that:

During my research abroad, my foreign colleagues and professors were exceptionally cooperative and supportive. Despite the language barrier with Chinese instruments, they assisted us in operating them and ensured their availability whenever needed. The professors mandated colleagues to be readily accessible, fostering a collaborative environment. (Interviewee 11)

Contrary to the positive impacts of interacting with foreign colleagues, only two participants (interviewee 7 an assistant professor, returned from China and 17 returned from China Assi Pro) claimed complaints. Indicating no impact of their foreign colleagues on their research, they argued distinctly by addressing:

It varies and depends on person to person but they did not have any collaboration with my research. My foreign colleagues have no positive attitude with me and I did not have any project with me. (Interviewee 7)

Our foreign colleagues primarily provide financial support by covering journal fees, but their involvement is limited. Communication with these colleagues is inadequate, restricting the research collaboration. (Interviewee 17)

In brief, interaction of the foreign colleagues reflected dramatic positive impacts on the research performance of RECA's in the university. They enhanced RECA's' research performance through their valuable knowledge advancement, support in research areas, knowledge, and data sharing. Consequently, they increased RECA's' research performance and research publication productivity in Pakistan.

Interaction with Domestic Colleagues

Showcasing various challenges while interacting with domestic colleagues after returning, interviewees explained their experiences in distinct ways in the particular context. Addressing the obstacles in interacting with domestic colleagues, interviewees explained complaints regarding lack of support and collaboration from their domestic colleagues, they added that:

I face challenges due to no support of my domestic colleagues because we expect more. Such as, in foreign countries, we twenty colleagues lived in a single room but here we don't want to share any two. Whatever you possess should be thanked. But, I try myself to be happy even if there are challenges. If one is skipped, the other origins. (Interviewee 1)

If we talk about thinking capacity building, which has been improved by foreign exposure. I bring things in process but, is there anyone among domestic colleagues to support them? This is the challenge. (Interviewee 3)

When I re-integrated into Pakistan. Since I am facing challenges. We take solutions for these challenges. This gap remains until I will not have good interaction with my domestic colleagues. (Interviewee 8)

As I returned to Pakistan, I faced challenges to integrate with my domestic colleagues. And, I even couldn't meet my friends and colleagues outside of the institution due to foreign ecological changes on me. I felt stressed interacting with my domestic colleagues. (Interviewee 12)

Instead of offering valuable opportunities for knowledge exchange, collaboration, and capacity building that contributed to the advancement of my research performance in Pakistan, still I face challenges interacting with my Pakistani colleagues. (Interviewee 19)

Returning here, I face various challenges. We don't have collaboration with the people in other universities for research work. So, there are no collaborations regarding research work to exchange research materials or use them. If they are friend-based you can collaborate with them not otherwise. (Interviewee 20)

Related to colleagues, there is no culture to interact with them to publish good papers at the international level. The thesis is rubbish types. So, we publish them in HEC-recognized journals. We are trying to solve such issues to get better. Here, everyone tries to work individually and invisibly. (Interviewee 23)

Furthermore, interviewees face numerous challenges to integrate with domestic colleagues. Indicating the constraints of cultural and communication barriers, some interviewees narrated that:

As we belong to different fields in the institution, so, it is difficult to integrate with my domestic colleagues. (Interviewee 5)

'Some people are friendly and some are not friendly. This is all over the world. So, this is not that all people will be friendly with you. Some are very encroaching and some are friendly and share their knowledge. Some give you information and knowledge. So, it is a mixed experience which I have. (Interviewee 22)

Contradiction to these interviewees, only a few participants appraised the impact of domestic colleagues' collaboration on their research performance. An assistant professor returned from China, argued that:

Research is a collaborative effort, and I've found success by forming a support group with three to four domestic colleagues. Through teamwork and perseverance, we overcame challenges and secured two significant projects worth 0.5 million and 0.23 million. (Interviewee 13)

Briefly, interviewees face massive constraints while interacting with domestic colleagues after returning from overseas. In addition, they highlighted various factors hindering them from integrating with their local colleagues. They included a lack of domestic colleagues' collaboration in research activities, communication barriers, a preference for individual work rather than teamwork, and a lack of knowledge exchange.

Research Skills Implementation

Regarding implementation of foreign acquired skills and research experiences in the domestic institution, interviewees showed different experiences. They represented different challenges hindering research skills implementation, including, limited access to research facilities, environmental and geographical constraints, and institutional barriers. Accordingly, some interviewees explained by complaining about the limited research resources hindering research skills implementation in the domestic institution as following:

We do not have such an environment to implement effective research skills and knowledge in the institution. If could get resources available, I would implement the skills and knowledge learned from a foreign country. (Interviewee 2)

When I returned, whatever I learned from foreign regions, I am unable to implement that skills and knowledge in Pakistan. What I learned there, those things are not here in Pakistan. Here are no machines and chemicals on which I worked in the host country. Due to lack of facilities, they are not implemented here. (Interviewee 5)

The specific skill I learned from the host country is ART (a technical skill used to take reproductive materials from organisms, combine them in the external environment, and then inject them to make organisms able to reproduce). In Pakistan, still I am not applying this technique but in some labs, the scientists are borrowing embryos from foreign countries to do this successfully. What I learned, is I am unable to apply this method because of the lack of basic facilities. (Interviewee 6)

Claiming on unavailability of funding opportunities, a professor from field of animal sciences claimed various challenges. He described that funding and money for research. Due to lack of funds, he tried many things in his country but failed. He stated the following.

Besides all, even if you want to do something in your country, you perceive it very difficult to reproduce upon your return. There is a need for a lot of money for lab equipment and instruments. We need funding even though it is low but just to get for initiations. We tried but failed to achieve it. (Interviewee 9)

Similarly others narrated about funding constraints that they perceive it very hurdling to implement foreign experiences in the domestic institution, due to lack of funding provision, though they have valuable research skills and techniques. They explained that:

During my research abroad, I focused on molecular-level studies, spending extensive time in labs analyzing comparative animal groups using computational methods. I also acquired data from Chinese companies, developing specialized skills in this area. However, upon returning to my home country, I've been unable to apply these skills due to funding constraints and a lack of essential reagents. (Interviewee 11)

It is very difficult to conduct research in Pakistan due to the implementation of methodologies I learned from foreign country. Firstly, underdeveloped laboratories are a very big problem for us here in the scientific community. Secondly, it is difficult to get projects from higher authorities due to an insufficient number of advertisements for projects. (Interviewee 14)

In addition to, some interviewees stated that environmental, and geographical factors are responsible for hindering the implementation of foreign-acquired research skills in the domestic educational landscape. In addition, differences in research methodologies between foreign and domestic colleagues have also been claimed by participants that hinder foreign research skills implementation in the university. In this regard, they termed as:

There is a difference between the research methodologies of foreign and domestic countries. Due to tropical or geographical changes, some methods are not applicable in this environment. They do not meet the environmental conditions. Due to this, implementation of foreign skills is challenging. (Interviewee 1)

I apply it too but not hundred percent in Pakistan. Their research methods in Pakistan are not applicable due to problems with funding and facilities. Obviously, there is a difference between research methodologies too. (Interviewee 4)

There is a huge difference between research methodologies between the host country and the domestic country. This depends on environmental factors. Due to the deficiency of facilities, I cannot implement those methods here. Aaaa...! I am able to apply only 50% of those foreign-learned skills and methods in Pakistan. (Interviewee 8)

Moreover, claiming on institutional and system barriers, a returnee from China narrated that:

Upon returning to my domestic research environment, I encounter significant challenges in applying the methodologies and concepts I learned abroad. Adapting these approaches to the local context proved difficult, as I had to consider factors such as institutional constraints. Furthermore, I faced resistance and skepticism from colleagues who were unfamiliar with or hesitant to adopt innovative methods. These obstacles hindered my ability to effectively integrate foreign-learned techniques into my research in domestic institution. (Interviewee 19)

However, an assistant professor, returned from China, explained with indicating no challenges to implement his foreign research skills and knowledge in the faculty in domestic institution. He narrated that:

I am trying to disseminate the foreign accumulated knowledge and skills with Pakistani academic society. And I face no challenges to apply those learnt research skills and paradigms in domestic educational setting. I am trying to bring research awareness at B.S level. By implementing my foreign research skills and knowledge, I made publications possible by B.S students too. (Interviewee 23)

To conclude, majority of interviewees encounter with various influential factors hindering them to implement their foreign valuable research skills and techniques in the domestic educational landscape. Moreover, interviewees identified the factors such as lack of developed labs, equipment, and unavailability of reagents/chemical for experiments and, geographical and system barriers.

Exosystem-Level Perceptions

Time Spent in Host Country

Time spent in the host country positively impacted interviewees' research performance by developing research skills and knowledge acquisition, personal and professional development due to foreign exposure. Indicating the importance of time spent in the host country, interviewees shared insightful experiences in terms of nuanced knowledge and skills acquisition by explaining that:

Time spent in the host country has significantly impacted my performance in Pakistan. I experienced to managing time. I became punctual which is a positive influence of time spent abroad on my research. During my time spent abroad, I learned some specific skills including statistical programs and research methods, and I experienced managing fields. (Interviewee 1)

My time abroad broadened my perspective and enhanced my skills. Specifically, I learned critical reading of research articles, and advanced laboratory techniques, including PCR (Polymerase Chain Reaction), cell culturing, and HPLC (High-Performance Liquid Chromatography). These skills, particularly in genetic engineering, have been invaluable. (Interviewee 4)

I experienced very much while living abroad. That time became beneficial for me. I learned Chinese language. There was too much work. I, nearly all the time, worked. Working there (in China) influenced my research positively because I was dedicated there. (Interviewee 5)

Definitely it was very positive. All the research techniques I learned during living in host country. Ph.D. itself is a skill. Its main function is to solve problems. (Interviewee 13)

I have gained valuable technical skills, research methodologies, and academic training while abroad. These skills significantly enhanced my capability and performance upon returning to Pakistan. These are allowing me to tackle questions and have greater proficiency and innovation. I have gained international exposure that enriched my understanding, research methodologies, and practices. (Interviewee 14)

I spent four transformative years in the host country, where I learned the local language and conducted research according to a structured schedule. The experience was incredibly beneficial due to access to advanced research facilities and guidance from foreign professors, whose expertise enabled me to complete six months of work in just three months. I gained knowledge of various research parameters, which I later applied to aid two students in the Pakistani academic setting. (Interviewee 8)

Similarly, indicating to learning from the positive international research environment while time spent there (in host country), two interviewees narrated that:

Those time (five years) that I spent in foreign country that has the impact in this way that I want to create an environment alike that. (Interviewee 6)

There is an extreme impact of the time spent abroad on research as it causes richness in research. It impacted my research as I got punctuality and regularity to do something. (Interviewee 11)

Moreover, continuing by arguing the impact of foreign positive time spent, one interviewee narrated about gaining personal growth and developing thinking capacity.

My research experience in the host country had a profoundly positive impact on me. Personally, it enhanced my thinking capacity and broadened my perspective. Professionally, it yielded tangible outcomes, including three published papers in international journals - an achievement I doubt I would have attained had I remained in Pakistan. I'm grateful for the opportunities I seized during my time abroad, which have elevated me to a level I wouldn't have reached otherwise. (Interviewee 12)

In addition, two interviewees stated regarding positive time spent in host country and compared time spent in host and domestic environment in the following way:

The international research experience had a profound impact on my career. Before that, I was conducting research at the Center of Excellence in Marine Biology at Karachi University. I then secured a U.S.-funded scholarship to study in China, completing my research in just three years. In contrast, my colleagues in Pakistan took around ten years to achieve similar milestones. The difference was stark. (Interviewee 15)

If I compare my education of eighteen years, I spent in Pakistan, with the education of four years, I spent in host country, so those four years are much heavier. (Interviewee 18)

I spent nearly 2 to 2.5 years in a foreign country. That environment bound me to work and everyone in that environment was working. When you see others working, you think to work. That environment (host country) keeps you motivated and you learn many things. As I lived there for 2-2.5 years, I got up would woke up on time. I felt no tiredness and bored there. I enjoyed there in working there. I learned many things during my stay abroad due to the positive learning environment. (Interviewee 21)

Moreover, emphasizing on the positive impact of the time spent abroad, two interviewees (17 and 21 assistant professors) narrated that they acquired hardworking capabilities and punctuality. They termed as:

My research was that which I worked there (in foreign). There I worked daily basis twelve hours per day in labs. I used to update research there what I would do. I completely focused on work. I linked work with others what others are doing what am I doing how better people are doing and what improvement can I bring. Every time I worked on research and updated general knowledge by newspapers. (Interviewee 17)

That time (I spent in China) was so productive. I devoted my time in research and creation in the host country. (Interviewee 23)

Moreover, indicating to the importance of time spent in host country, one interviewee narrated about the personal development. Stated that:

The time I spent there was very pleasant, very energetic and very motivated. Host country intellectually developed me and sent me back with a broad mind. (Interviewee 9)

However, expressing slight challenges faced by an assi prof interviewee while living abroad. He faced not it easy to stay in host country. Particularly, he faced difficulties in data collection procedures. He narrated that:

Time spent in host country was not easy, as there was difficulty of data collection. But, it is easy here. (Interviewee 3)

Hurdles of language and food were faced. Other nothing was there that influenced me. No negative impact is on me. Aaa! Obviously I discovered new methods. Chines also followed it. I also made a product while living in host country. (Interviewee 7)

To sum, interviewees had overwhelmingly a positive impact of time spent in foreign countries. They indicated that they acquired nuanced research skills and knowledge, statistical programs, useful research methodologies, experimental techniques, personal and professional growth, international collaboration opportunities, hardworking and punctuality habits to do comprehensive research in the domestic university.

Institutional Policies

Institutional policies and rules have a significant indirect impact on researchers' performance. Concerning this, the majority of participants complained about the domestic institutional policies and showed satisfaction with foreign policies due to the positive effects of time spent in international countries. In this regard, interviewees claimed that:

I am impressed with foreign institutional policies, which are highly standardized and efficient. During my time abroad, I found that any facility I requested was readily available, as the necessary policies were already in place, making the process seamless and hassle-free. (Interviewee 6)

Moreover, showing satisfaction with international systems (interconnected components that work together), some interviewees favoured international policies due to follows, tracks and comprehensive support. They explained that:

I am satisfied with international systems. There are follows, tracks, and patterns. (Interviewee 7)

I am 100% satisfied with the host country's systems, which provided me with comprehensive support, resources, and research parameters. In contrast, I'm less than 20% satisfied with my home country's systems, citing lack of socialism and support. (Interviewee 8)

Compared to domestic institutional policies in Pakistan, the policies, rules, and content of international institutions are generally more satisfying in terms of research performance. International institutions provided me better facilitation through substantial funding, advanced infrastructure, and comprehensive access to resources like peer-reviewed journals and global research networks. Their policies typically emphasize rigorous research standards, interdisciplinary collaboration, and innovation that contrast to the Pakistani institutional policies. (Interviewee 19)

In addition, indicating delays in the rules and systems of domestic institution, some interviewees claimed by explaining the following.

Specifically, related to policies, when you want any chemical here in Pakistan for research, it consumes time, and in the host country, it was not similar to this. In the host country, when you wanted any facilities, you would get it within days. Here, it takes months to have it for your research, and there is a delay. If you wanted any research equipment that was not in your lab, they would arrange it soon. (Interviewee 10)

Indicating to delays in system and favouritism in the institution, some interviewees claimed very clearly. They made a comparison between international and domestic institutional patterns. They quoted as:

The foreign institutions were much facilitated. Every institution and even when I visited schools had discipline. Their process was fast. The institution and filing system were systematic. When I returned to Pakistan, as an officer I visited the administration for files. Most of the time, files are lost. And it wastes our time. This dissatisfies me. Every officer here comes based on political references without any merit or abilities. And they use illegal rules to benefit themselves by destroying institutions. (Interviewee 12)

International institutional policies were inductive for research. They motivated you to work. International institutional patterns helped work. The institutional environment was motivated and equal for all. However, domestic institutional policies are just for some people. Here is favoritism. Rules are just for us but not for their people. Favoritism caused changes for us to do research. (Interviewee 23)

However, regarding improper implementation of policies and rules, some interviewees represented his insights very clearly that rules are almost similar regarding research however, issue is of implementation. Documented policies in Pakistan are appreciating but practical policies are lacking. They described that:

I just mention to you that the rules and regulations, terms and conditions, are almost similar in every country. The main issue is the implementation in a true spirit. If the implementation is true, then it would be very good for our country. But the problem in our country is that implementation. Rules are not being implemented as they are on pieces of paper. I can say that the problem is of implementations. (Interviewee 16)

Foreign research institutions have stringent rules and regulations, ensuring high-quality research and providing necessary resources. In contrast, domestic institutions lack these standards, despite having well-documented policies that are not implemented. This disparity makes it challenging to conduct research locally. (Interviewee 21)

In foreign institutions, promotions and benefits are solely based on performance, regardless of age or background. In contrast, domestic institutions prioritize seniority over merit, with the outdated formula "get old, get more." I advocate for adopting the "do more, get more" approach, which benefits both individuals and institutions. (Interviewee 22)

Briefly, interviewees expressed devastatingly dissatisfaction with domestic institutional disciplines. Interviewees preferred foreign institutional policies due to their positive impacts on their research

performance. They highlighted several domestic institutional rules and policies making them demotivated to do research. They identified the influential factors including, delays in policies, favoritism, lack of proper implementation of documented policies, and prioritization over merit. Moreover, by showing satisfaction with international institutional policies, they indicated the effective factors including strict rules and policies, performance-based system, and well-structured and helpful systems.

Macrosystem-Level Perceptions

Cultural Differences and Re-adaptation

Majority of the interviewees showed no significant impact of cultural differences on their research performance in Pakistan particularly in the perspective of tradition and language. Indicating no impact of culture on research performance, participants explained the following quotations.

Cultural differences do not affect research performance. Re-adaptation to Pakistani culture was not challenging. (Interviewee 3)

Research is not associated with culture. Habits can influence, but culture does not impact research. (Interviewee 5)

Culture does not interfere with research. Scientists are like-minded, and culture is not a factor. (Interviewee 6)

Cultural impacts are not found on scientific research but on social research. Scientific research is based on universal rules. (Interviewee 11)

Culture has no direct or indirect impact on science. Different thinking patterns exist between Pakistan and foreign countries. (Interviewee 13)

Culture is not the issue, but the working environment and people's understanding are. Focus should be on research to solve social issues. (Interviewee 17)

Cultural differences exist, but foreigners prioritize research. Local culture and traditions do not hinder research. (Interviewee 20)

However, one interviewee narrated that cultural differences between international and domestic communities significantly impact research performances. And he claimed learning environment too. In this regard, he termed that:

Cultural differences impact research performance. Incentives and conducive environments for research are lacking in Pakistan compared to China. (Interviewee 23)

Moreover, some participants narrated that they faced numerous challenges in the most beginning of their returning to Pakistan. However, with passage of time, they are getting adjusted in the new environment. Regarding culture, they faced hurdles. They explained very noticeably that:

Culturally we were open there but not here. Whatever you liked to wear, you could, liked to speak, and you could. There, people would not ask you but here even people say something about your hair. This challenge has been faced in our culture since I returned to Pakistan. People have the behavior of critical review of any culture in the domestic country. This is challenging. (Interviewee 1)

I faced challenges for 6-12 months due to habits and cultural discipline from the foreign country. I had to adapt to a new environment and way of life. I found it difficult to adjust to the cultural differences. I think the host country's culture was more open and accepting. I faced challenges in my research due to these cultural differences. (Interviewee 4)

Abstractly, interviewees perceive no impact of cultural differences on scientific research performance. Interviewees mentioned that scientific research is based on universal rules, so, they considered no cultural impact on their research performance. Indicating that all the scientist are like-minded, so their performance is not impacted by interacting with different cultures and traditions. However, the language barrier was marked as an influential factor impacting their research performance. In addition, only two interviewees expressed confrontations integrating with domestic cultures after returning from living in foreign cultures in the host country.

Re-integration and Research

The scholars who come back from overseas, have different experiences due to foreign exposure, level of knowledge, research skills, and higher dreams contrasting to local scholars. Moreover, they had lived in different cultures, religions, traditions, and economically developed environments. However, upon returning to their domestic country, they may struggle to re-integrate into the domestic environment due to environmental factors that are dissimilar to the international environment. These all factors can directly and indirectly impact their performance. Consequently, they feel challenging to balance their research work and transfer foreign knowledge to the domestic institution due to different ecological differences between host and domestic country.

In view of that, by expressing their constraints to re-integrate with domestic environment, interviewees narrated:

Since I returned from a foreign country to Pakistan, I have been facing many challenges but no opportunity I am availed. I face challenges to integrate with the domestic environment. (Interviewee 1)

Adjusting to this environment is difficult. I face hurdles and I feel isolation due to indirect impact of the environmental factors. (Interviewee 23)

Adding more, they explained difficulties in conducting research in the domestic institution due to various factors. They face lack of research resources, students' lack of background knowledge, language and tradition issues. In this context, research participants elucidated that:

Research challenges... I face research difficulties in Pakistan after returning from overseas. I face increasing hurdles due to lack of research facilities, collaboration in research work, lack of technologies for research, lack of students' background knowledge and language and tradition issues in the society. (Interviewee 15).

Including various factors similar to these, participants complained regarding their balancing with work environment. Continuing in this context, they addressed that:

Striking a balance with the domestic work environment is difficult. I feel challenged to do research with my foreign experiences. As the geographical ecological parameters of everyone are different from each other, there must be a balance between these two systems. I face challenges in balancing the conflicts of these two systems, and I try to find a middle ground to adapt to both environments. Due to various factors, I feel frustration and stress in working and research. (Interviewee 18)

Moreover, concerning the knowledge transfer in the domestic institution, some participants displayed constraints due to identifying various factors. By explaining their knowledge transfer confrontations, they argued as following:

Transfer of foreign-acquired research knowledge and implementation of research skills is very difficult in Pakistan. I don't have research facilities, funds, and resources to effectively implement my foreign skills in the domestic institution. Students' weak backgrounds make it difficult for me to transfer my research skills in the classroom. Choosing words while lecturing, according to culture and tradition, is difficult in the institution. (Interviewee 17)

I learned many research skills and methodologies during my stay abroad. However, it is difficult to transfer my knowledge to students and the environment. This is a stressful environment. Knowledge transfer is difficult. (Interviewee 22)

At the last, participants opined on how ecological factors influence their research performance. By highlighting differences between host and domestic institutions, they showed their experiences very clearly in the following responses:

Yes, ecological factors such as politics, economy, culture, and tradition impact research performances. Foreign culture, collaboration, support, and facilities supported me to do research. The presence of funds and chemicals in labs helped me. (Interviewee 16)

Ecological factors are influencing our research here. The skills that I learned from there, are not being utilized here. Day by day the skills are decreasing and energy is wasted due learning environment and facilities. I am feeling difficulties when I return to my domestic country regarding my learned skill, exposure, and modernity but to adopt these things is difficult here. When I want to change anything in the institution, it is challenging from both the family side and the institution whether it is a financial issue or others. Due to this, learned skills are consuming and getting rusted and energy is consuming. (Interviewee 12)

The ideology, religion, culture, politics, and economic factors impact research performance in Pakistan but not in foreign countries. And our research (science field) differs from social sciences so these factors do not impact that much. I observe difficulty in keeping balance between two systems due to these factors. (Interviewee 13)

See, ecological factors, the culture, religion and economic significantly impact our research performance here. These factors affect us 100%. Due to this I can't do research well. If I exemplify this, see Federal Funding Accountability and Transparency Act (FAFTA), a meeting in Paris was held with the aim that Pakistan is not allowed to buy sensitive equipment directly. However, any third person will be responsible then Pakistan can buy. If we see this, ultimately we have barriers in research. Due to this, it wouldn't be righteous to say that I can easily work while living in this system. Every factor is involved. I can't blame any one factor only. (Interviewee 18)

As a result, interviewees represented significant constraints to re-integrate with the domestic environment, people, and institutional systems due to various influential factors. Specifically, knowledge transfers constraints and ecological changes between host and domestic country significantly impact them to get adjusted with local systems. Critically, interviewees face difficulties in transferring foreign research skills to the students in the classroom and meeting with people outside the institution due to foreign exposure. Students' weak background knowledge in the area of study is one of the biggest challenges for the returnees that hinder their positive integration with domestic students. Moreover, interviewees expressed that differences between ecological factors such as economic and language, and lack of networking with

administration and community hinder their research performance. Living in domestic ecological systems after returning from abroad, made them exceptionally isolated and they feel stress working in the domestic university.

DISCUSSION OF THE KEY FINDINGS

At the microsystem level, the study revealed that participants appreciated foreign colleagues' interaction more advantageous to their research performance in the domestic country compared with local colleagues' interaction. Indicating that foreign colleagues fostered their research performance by sharing advanced knowledge, and research skills, supported in research conduction, and assisted in research publication productivity in Pakistan. While interaction with domestic colleagues has no positive impact on their research performance. Demonstrating a lack of support in research performance, networking, and communication regarding research activities. Also, the study found that domestic colleagues prefer individual work rather than teamwork impacting returned early career academics' research performance in Pakistan. These findings are consistent with the foregoing findings of the study conducted in Vietnam by Young and Napier (2019) who examined the impact of foreign and domestic colleagues' interaction on foreign-retained academics' research performance. The study found that Vietnamese researchers have higher research productivity and publications with foreign colleagues as compared to local peers in Vietnam. Explored that foreign colleagues make more contributions to returnees' research, they are more supportive than domestic colleagues regarding research performance. Similarly, the existing study's findings are also in line with Azeem and Aslam's (2024) findings who conducted a research study in Punjab, Pakistan. They found that foreign-educated scholars appreciated the collaboration of foreign colleagues on their research performance contrasting the collaboration of domestic colleagues. They found that foreign-educated scholars face numerous challenges upon returning to Pakistan in internationalizing their foreign knowledge and skills due to lack of domestic colleague's interaction.

Moreover, the study revealed that RECAs encounter challenges in implementing foreign research skills and knowledge in domestic institutions due to several factors. They include inadequate equipment, absence of re-agents/chemicals and differences in geographical factors between foreign and domestic environments. These findings are in line with the findings of a study conducted by Sparks and Temerbayeva (2019) in Kazakhstan. They found that RECAs face several challenges in implementing and exchanging foreign learned skills and knowledge with domestic institutions due to local support and limited access to research resources.

On the environmental aspects, the study found a stark contrast between foreign and domestic institutional environments impacting RECAs' research performance in the local landscape. The study found that foreign educational environments had a positive research culture, honesty among researchers, and motivation to conduct research works. However, the domestic environment lacks such crucial elements and research support. Due to these factors, participants feel frustrated in a domestic environment. In this context, Shettima, John, and Grace (2024) argued that RECAs face numerous challenges working in a new environment. Because, the work environment encompasses academic structure, policies, and people (Mason, 2023) which differ from their foreign institutional environment (Sing & Chowdhury, 2021). The findings of the existing study are consistent with some foregoing studies. For example, Chen and Li (2019) found that foreign-retained academics face numerous challenges working in domestic environments due to resistance from colleagues and unsupportive institutional culture. Similarly, Bookman (2020) explored that foreign-educated scholars working in California, U.S, feel isolated in the working due to differences between foreign and domestic academic environments and differences between the policies of the two systems.

At the exosystem level, exploring the impact of time spent in the host country on the RECA's research performance, the study revealed that participants indicated positive time spent in the host country. In addition, the study found that participants developed their research skills and experiences, gained statistical and new research methods, experimental techniques, enhanced international research collaboration, professional networking, punctuality and hardworking habits, and developed personal and professional efficiencies. As supported by Bozeman & Al (2001) that academics' research performance with others in research is influenced not only by their research experience and skills but also by their interactions with individuals possessing different professional and technical knowledge in the research field. This result is consistent with the previous findings of a study which was conducted in China aiming to examine the impact of foreign studies on the returned academics' research activities with foreign researchers. The findings of the study indicated the positive impact of time spent in the host country and the support of foreign colleagues on returned academic research performance. The time spent in host countries helped participants gain social capital contributing to international co-publications (Jonkers & Tijssen, 2008).

Regarding the policies and rules, the study found that participants favored international policies regarding research contrasting to the domestic institutional rules and policies. Moreover, the study identified various policies-related factors impacting RECA research performance in the domestic institution including delays in policy implementations, nepotism using policies in the institution, deficiency in applying merit-based systems, and inadequate implementation of documented rules. In addition, the study found that domestic institutional policies and rules have a dramatic negative impact on participants' research performance because these rules differ from the rules and policies they lived in the host country. While living in the institutional rules of the host country, they observed performance-based policies, and merit-based prioritization, and motivated learning policies that satisfied participants and mirrored positive reflections on their research performance in the host country. Similar to these findings, Lowe, Whitman & Phillipson, (2009) highlighted that performance of the individual in an environment is affected by human activities such as policies in which an individual develops. Similarly, Creswell (1985) added that an institution's environmental beliefs, rules, policies, values, and content significantly impact the research performance of academics. In addition, upon their return to Pakistan, ECAs face numerous challenges due to various ecological factors. Such as institutional policies (Asharaf & Eduan 2018). Also, the findings of the existing study are consistent with the foregoing findings of the study conducted by Tran et al., (2022) aiming to examine Vietnamese graduates' perceptions regarding the impacts of contextual factors. The study found that international institutional policies significantly impacted their research performance in their domestic countries as they were dissimilar from local institutional policies. The findings are also supportive to the Asharaf and Eduan's (2018) findings. They found that RECA's who returned from the UK and USA face challenges from institutional policies lacking a positive research cultural environment in Pakistan compared to the host countries.

At the macrosystem level, the study found that scientists are like-minded and scientific research is universal everywhere. Hence, cultural differences between the host and domestic country do not directly impede RECA's research performance upon their return to Pakistan. This finding is contrary to the prior finding of the study conducted by Chen (2022) in Japan. Finding that cultural differences between the host and domestic country significantly impacted returnees' research performance in Japanese institutions. Moreover, the existing study found that participants experience cultural re-adaptation challenges due to various factors including solid culture, criticisms, and life patterns. In addition, the study revealed that participants face challenges in adjusting to cultural norms and values upon returning from the host country. These findings are consistent with the previous findings of the studies. For example, Ahmed et al. (2023) found that returnees faced challenges related to ecological factors including cultural differences between the international and domestic environment. Similarly, Chiang and Liao (2008) found that

returnees from Australia face challenges to re-adapt domestic cultures in Taiwan due to interaction with foreign cultures in the host country. In addition, Haryaba, Guilfoyle, and Knight (2013) found that foreign-returned academics also face significant challenges in Australia to re-adapt domestic cultures.

Furthermore, related to re-integration, the study revealed several factors impeding returned academics in re-integrating with the domestic country's people and institutional elements. The study highlighted influential factors, for example, ecological changes between international and domestic countries, funding constraints, and international mobility causing obstacles to re-integrate with domestics. The findings of the existing study are in line with previous findings of the study conducted by Thi et al. (2021). Highlighting that institutional workload and resources significantly impact Vietnamese foreign-educated scholars' re-integration with institutions. Similarly, Li, Xing, and Zuo (2024) found that significant factors impacting RECA's research performance and re-integrating with domestic institutions. The study found that RECA's face challenges in balancing teaching and research work, lack of institutional support, and achieving research projects. In addition, the findings of the existing study are also consistent with the study findings of Ai & Wang (2017). They found that foreign returnees encounter various challenges to re-integrate with Chinese institutions. For example, cultural changes isolate the researchers as they return to their domestic country after living in an international country. Consequently, they struggle to re-integrate with domestic institutions. Similarly, the findings of the existing study are also supported by the previous study. For instance, Schartner, Young and Snodin, (2023) found that foreign returnees face various constraints in Thailand universities to re-integrate. Concluded that foreign academics, working in Thailand are feeling unadjusted in the higher educational institutions due to lack of institutional support.

Concerning knowledge transfer, the study revealed that participants face numerous hurdles to transferring foreign-acquired research skills, knowledge, experiences, and techniques in the local institution hindered by several factors. The hindering factors include a lack of resources, students' limited background knowledge regarding the research area, and choosing suitable words in the classrooms to meet domestic cultures and traditions. In addition, the study found that such prominent factors impact their proper knowledge transfer within the institution and causing to feel isolated and stressed to re-integrate with the Pakistani community. This finding is consistent with the earlier study findings conducted by Thuy (2017) in Vietnam. The study concluded that returned academics encounter difficulties in transferring foreign-learned knowledge, skills, and research experiences within the domestic environment. These factors included differences in human resource capital between the host country and domestic country, strong values of hierarchy, defined roles between academics and managerial staff, lack of shared mind-sets, and, traditional thinking capacity of the local people.

Concisely, the study revealed that cultural differences between foreign and domestic countries showed no impact on research performance as all the scientists are like-minded and research everywhere based on natural phenomena. However, the study revealed that cultural re-adaption is challenging for returnees after foreign exposure and the life pattern of the local society. Moreover, the study showed that returnees also encounter hurdles to re-integrate with domestic people and institutions due to ecological changes between the two systems, lack of funding provision, and international exposure. Additionally, the study identified various barriers hindering returnees to transfer knowledge within the domestic environment. The study identified the factors hindering knowledge transfer in the domestic institution comprising unavailability of resources, students' lack of background knowledge regarding study areas, and difficulties in choosing words to meet local traditional norms while supervision.

CONCLUSION

At the first level, the study found that RECA's encounter various hurdles when interacting with domestic colleagues. The study explored many factors hindering them from positively interacting with domestic

colleagues resulting negative impact on their research performance. In this regard, the study highlighted that domestic colleagues' collaboration regarding research, lack of communication to exchange knowledge, and lack of support from domestic colleagues due to extreme expectations. Moreover, the study found that domestic colleagues prefer individual-based research over collaborative work for research performance and publication. Due to these factors, RECAs face challenges in implementing and sharing their foreign-acquired experiences, knowledge, and research skills in the domestic environment with colleagues and students.

At the second level, the study found that RECAs showed satisfaction with foreign institutional policies and rules over domestic institutional policies and rules regarding research performance. The study explored various domestic institutional factors causing negative effects on participants' research performance. They consisted of delays in domestic institutional policies, favoritism in policy implementation, a dearth of proper execution of written rules, and prioritization over merit. However, these institutional disciplines are contradictory to foreign institutional policies and rules. Returned academics spent valuable time in the host country. They acquired effective research skills, and statistical programs and expanded their knowledge. However, their foreign-gained research skills and techniques are getting rusted and blurred due to a lack of effective research policies in domestic institutions.

At the third level, the study found no direct impacts of international culture and religion on RECAs' research performance. However, international language barriers slightly impacted their communication with international communities. In addition, the study found that cultural exchanges did not impact scientific research performance indicating research as a natural phenomenon equal all over the world. However, the study found that RECAs face challenges regarding cultural re-adaptation, when they return from the host country, due to local people's mindsets and life patterns. Furthermore, the study found that participants struggle to re-integrate into the domestic environment and face hurdles in transferring foreign learned experiences to domestics due to various factors. These factors indicate differences between foreign and domestic countries as ecological factors (economic and political), students' limited background knowledge of research areas, and difficulties in opting for proper words to meet the traditional values of the people in/outside of the classroom. Moreover, foreign exposure, and disjoining from domestic cultures, made returnees feel isolated and stressed to work in the domestic institution.

RECOMMENDATIONS

On the basis of the findings, the study suggests various crucial recommendations for the need to facilitate RECAs in the domestic institution. To foster domestic collaboration, HEC should establish domestic research networks by providing digital platforms to enhance knowledge exchange between early career academics and senior domestic stakeholders. Moreover, HEC should establish mentorship programs to pair RECAs with senior ones for effective guidance and support in the institutional departments. By programming of the seminars, RECAs can easily share their foreign-learned research techniques and methodologies with domestic students and stakeholders. Government should implement solid rules to install merit-based systems, streamline policy application, and ensure lucidity. Provision of research projects, funds, and research resources such as instruments and chemicals for experiments will booster RECAs research performance. The government should put performance-based evaluation to provide research projects to enhance publication productivity with domestic colleagues and overcome nepotism in funding provision and policies implementations. Counselling and guidance services can overcome isolation and stress of the RECAs.

Contribution

This study contributes a role as key to opening doors to outlook how the previously unexplored area in literature is bridged to provide new possibilities and roadmaps for future researchers to move on. Moreover, the study contributes to the understating of Bronfenbrenner's EST from the perspective of RECA's research performance in Balochistan, Pakistan. Similarly, the study informs policymakers about the need for targeted interventions to address the RECA's constraints which they face in their career after returning from overseas. The study generalized Bronfenbrenner's EST to understand the challenges faced by RECA's to effectively perform research activities. The study also supports social capital theory by emphasizing its importance concerning social networking and interconnectedness which can help making social networking between the RECA's and their domestic colleagues. Moreover, contributed to suggesting the utilization of Acculturation Theory to discover RECA's challenges regarding cultural re-adaptation and re-integration with cultures, traditions, and religions helping how to transfer knowledge easily.

Limitations and Suggestions for Future Researchers

The study emphasized only on the impacts of ecological systems on foreign-educated Pakistani scholars working in Pakistan. This study collected its data from one Pakistani university. So, its findings can't be generalized to a larger population in Pakistan and as well as other countries. Also, this study emphasized on the exploration of external factors, such as collaboration among colleagues, cultural exchanges, economic and political factors and institutional policies, affecting returned early career academics research performance in the university. However, limiting to emphasis on internal factors, such as motivation, expectations, research interests, mental health and well-being, self-identity and burnout, impacting RECA's research performance. Additionally, this study was only qualitative and limited to incorporating mixed methods of research.

Future researchers can explore how Pakistani-educated scholars from local universities face challenges in their early career development. Future researchers can conduct comparative studies to explore how foreign-educated scholars are facing different ecological challenges in Pakistani universities compared with locally educated scholars. Moreover, future researchers can incorporate mixed methods of research to explore more critical challenges in the same area of study. Also, expanding the sample size in the other universities in Balochistan and Pakistan beyond and even in other countries can enhance and generalize the results of the study. Moreover, future researchers can combine other theories as research frameworks: Social Capital, and Acculturation theories, with Ecological System Theory to address more critical effects of ecological systems on the RECA's research performance and explore their experiences regarding foreign exposure. Addressing RECA's challenges regarding research, they can excellently contribute to knowledge creation, skills assimilation, and moral values to promote sustainability in the university contributing in human capital development.

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