

5. Methodology

This chapter outlines and justifies the methodological choices which guide this study. In addition to the importance of adhering to scientific principles, transparency is vital in relation to the empirical path which guides this project because *science diplomacy* is a new research field which is limited by the lack of available empirical evidence (section 2.6); furthermore, SICs have largely been neglected by academic scholarship. This study follows an inductive and exploratory form of logic, which is manifested in a qualitative and interpretive research design to address the novelty of SICs as instruments (section 5.2). It is designed in a comparative way and analyses two significant SICs in depth (a *service-oriented SIC* and a *representational SIC*). This thesis uses new and first-hand empirical data in the form of interviews and documents. In combination, these two sources generate rich insights into the emergence and development of SICs and allow for triangulation. Moreover, these two types of sources can also compensate for each other's limitations, such as a lack of availability and access to data (section 5.3). This chapter also outlines the data processing and methods of analysis used (section 5.4). It concludes with a reflection on the methodological considerations and the limitations related to the choices that were made (section 5.5).

5.1. Research Questions

This thesis addresses the following key research question:

How can the development and institutionalisation of SICs as distinct policy instruments of science diplomacy be explained?

This question can be divided into four sub-questions which help to answer the main question. These four sub-questions draw on different data sources:

- (1) What are SICs and how can they be characterised?
- (2) Why did SICs emerge and how have they developed since their genesis? How can the current model be explained?

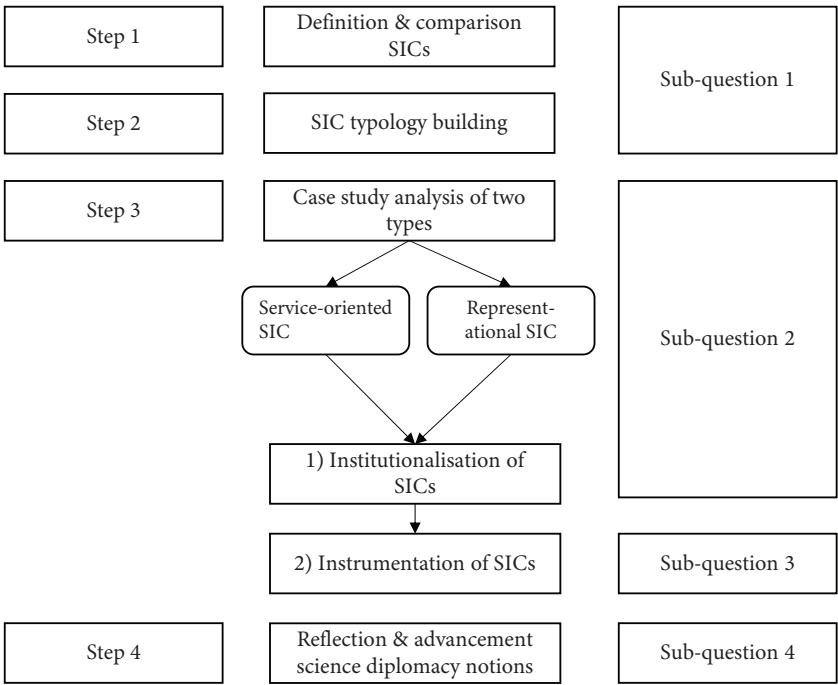
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- (3) Which actor groups are involved in SICs and what explains their participation?
- (4) How can the study of SICs be used to further understand and advance the concept of science diplomacy?

5.2. Research Design

This study is inductive and applies four steps in order to investigate the overall research question (see Figure 4). In step one, a working definition of SICs is embedded into a comparative overview of SICs. This comparison paves the way for a SIC typology-building exercise, which constitutes step two (cf. Kuckartz, 2006). In step three, two of the SIC ideal types which were identified in the previous step are subject to closer empirical investigation. A heuristic framework has been designed (see chapter 4) in order to examine the (gradual and historical) institutionalisation of the instruments, as well as their instrumentation by key actors. These insights inform step four of this study: reflection on the scholarship of science diplomacy, which is in its infancy and is largely based on normative prospects. The following section outlines the underlying methodological assumptions.

Figure 4 Research Steps



Source: created by the author.

5.2.1. Typology Building

In a first step, this study maps out the spread of SICs as a growing phenomenon. This instrument has to a large degree been neglected by academic scholarship and this comprehensive mapping exercise constitutes a logical first step to approaching the subject inductively. Furthermore, the mapping exercise serves as a basis from which to propose a solid definition of SICs, which then informs a typology building exercise. This typology building exercise is more encompassing than the one offered by Rüffin (2018) since it is informed by more countries and sheds light, in a more

refined way, on the governance of science diplomacy⁸⁶. Three different types of SICs are identified: service-oriented, representational and policy-led SICs. These instrument types form the structure of the SIC landscape. Typology building is considered to be a useful strategy for generalisation and structuring purposes in qualitative research; this is particularly relevant for novel phenomena (cf. Kuckartz, 2006). According to scholarly literature, there are four consecutive steps that lead to the creation of types: 1) identifying relative dimensions for comparison (in this case, governance set-up, funding mechanisms and core tasks, to name a few), 2) aligning the empirical cases accordingly, 3) analysing the context to ensure internal validity, and 4) characterising and defining these types (Kluge, 2000).

Internal homogeneity and external heterogeneity are key principles in typology building. Distinct types should be created that reflect high internal homogeneity, while also indicating a high degree of heterogeneity towards the other types identified (Kluge, 2000). These steps have been accounted for to ensure a rigorous approach towards the development of a typology (see section 3.4). In line with this research approach, “*natural types*” (Kuckartz, 2006, p. 4052) were identified, which are empirically inspired and derive from an inductive research exercise (as opposed to being theory-led). The typology-building exercise described above is the starting point for this study and underlines its exploratory approach. Moreover, this paves the way for the subsequent analysis since the aim is not only to describe SICs but also to understand and explain them (this will be explored in depth in the analytical chapters).

5.2.2. Comparative Research

This study is firmly situated in comparative design logic. This path enables a better understanding of SICs than would be possible if a single case study alone was used; a comparison allows the researcher to gain a deeper understanding of the phenomenon at hand (Heidenheimer, Hecl, & Teich Adams, 2005). Drawing on scholarly literature, comparative research “*collects data and/or carries out observations across national, geographical, and cultural boundaries in at least two of such entities, and systematically*

86 The attempt at typology building by Rüffin (2018) is less encompassing in terms of the countries it is informed by, while the criteria are also not specific and refined enough to shed light on the governance of science diplomacy (see footnote 59).

relates those entities in a comparative analysis" (Kosmützky, 2019, p. 1). Such literature assigns tremendous benefits and challenges to comparative research designs. For example, comparative research is complex since an awareness of different contexts is necessary. In the case of this study, an understanding of both the German and Swiss contexts is essential in order to position and understand the respective SICs. For instance, in relation to the level of stakeholder engagement in the German and Swiss SICs: would one really assume a similar degree of involvement to be at stake in both cases? Or might this be a false assumption based on insufficient contextualisation?

While language barriers were not encountered in these two cases, key challenges in comparative research relate to *"analytical logic"* and *"intellectual observation"* (Kosmützky, 2016). To expand on this, a continuous sense-making exercise needs to take place which navigates between uncovering similarities and differences and verifying them. While this constitutes a key challenge, such translation exercises also provide the greatest benefit (Gupta, 2012; Kosmützky, 2016; Smelser, 2003). The ongoing dialectic of similarity and dissimilarity enables unique elements to be identified. These considerations provide a key justification for the selection of two SICs for closer analysis in an attempt to expand the understanding of this novel instrument. In other words, this makes it possible to elucidate the *"features of a larger class of similar phenomena"* (Gerring, 2004, p. 341). Following the typology creation which structured the SICs landscape, two of the three models were selected for comparative analysis, as will be justified below (section 5.2.4): the service-oriented model (Switzerland) and the representational model (Germany).

5.2.3. Case Study Research

The qualitative comparative design here is further enriched by considerations of case study research. Gerring defines a case study as *"an intensive study of a single unit with an aim to generalize across a larger set of units"* (2004, p. 341). Case study research proves to be a promising strategy when considering

"a contemporary phenomenon within its real-life context, especially when [...] the boundaries between phenomenon and context are not clearly evident. In other words, you would use the case study method because you

deliberately wanted to cover contextual conditions—believing that they might be highly pertinent to your phenomenon of study” (Yin, 2003).

Case study research, however, does not suggest the use of a specific method. Instead, it recommends drawing on multiple methods to generate evidence such as interviews, surveys, observations or content analysis (Borchardt & Göthlich, 2009, p. 37; Yin, 2003). This further involves collecting various primary and secondary documentary sources such as protocols, (annual) reports, website information, speeches or newspaper articles (Borchardt & Göthlich, 2009). This combination of data sources allows for triangulation of the data (Flick, 2011), which is defined as combining various perspectives, or methods in relation to the research object. Flick argues that doing so allows researchers to generate new findings (Flick, 2011). The previous sections highlighted the benefits of comparative case study research while suggesting data sources to be sampled. The next section specifies the selection criteria.

5.2.4. Selection Criteria

The case study selection follows a purposive sampling strategy. This means that interesting and distinct cases are sampled according to the researcher's judgement (Babbie, 2004, p. 183). Purposive sampling is justified in those situations where the number of cases to draw from is small (cf. Seawright & Gerring, 2008), as in the case of the present research context. This strategy hence motivates the exploratory and inductive character of this study. In this study, a *service-oriented SIC* (Swissnex) and a *representational SIC* (DWIH) have been selected for in-depth analysis. These cases were chosen because they are considered leading examples and forerunners of SICs, and the expected findings seem to be more distinct and innovative if these two models are chosen. Both SICs have been in place for (a very) long time. Swissnex could be described as the mother of all other SICs since it was created more than 20 years ago. Germany's SICs were set up 10–12 years ago, while Swissnex served as an example of a policy learning exercise for Germany (Epping, 2020). There is also an element of natural selection due to the small number of cases to draw on (for instance, only one example of a representational SIC could be identified).

Apart from these considerations, analysing a service-oriented SIC and a representational SIC is seen to provide more innovative insights into the

institutional governance of science diplomacy. Both cases have established distinct organisational units, which largely operate outside the diplomatic umbrella and are hybrid concepts in terms of their actors, themes and set-up. As such, these two models differ from the third model which was identified: the policy-led model (for an overview of all three SICs types, see Table 6, p.49). Policy-led models are an integral part of a country's diplomatic representation body which presumably operate largely within this (bureaucratic) framework⁸⁷. In contrast to this, the other two SICs create a distinctly new setting which might redefine ways of working because of their network character as well as the different actor groups they bring together. Accordingly, they seem to operate in a less hierarchical way. What is more, an actor-specific perspective could be gained by studying these two models, which would presumably not be gained to a similar degree if a policy-led model was selected. This is because of the differing set-up of policy-led models (see section 3.4.3). Therefore, the level of institutional innovation that can presumably be revealed for the understanding of SICs is considered to be higher if a representational model and a service-oriented model are selected for in-depth analysis. This ultimately generates novel insights into the governance of science diplomacy and enables unique patterns of interactions to be identified. Policy-led models are nonetheless interesting cases for analysis, and distinct avenues for further research will be presented in the final chapter of this study (see section 13.5). The remainder of this section discusses obvious similarities and differences between the two cases in terms of their national contexts.

5.2.4.1. Similarities Between Germany and Switzerland

Germany and Switzerland are comparable based on some criteria; however, there are also notable differences. In scholarly literature, it is not uncommon to find comparisons of these two countries, for instance in relation to their (higher) education systems and policies (cf. Graf, 2013; Heidenheimer, 1997). To start with, both countries are federally structured and operate in a rather decentralised way (Griessen & Braun, 2008). This is illustrated

87 The policy-led model constitutes a distinct case to understand the interconnectedness of a SIC to political goals and how it responds to them. Moreover, studying policy-led models could be useful in analysing their functions and contrasting them with other divisions in embassies which have a similar purpose. Specific avenues for further research are discussed in section 13.5.

by looking at the relevant field of (higher) education and science policy: in Germany (higher) education and science policy is at the competence level of the Länder (BMBF, 2018), while in Switzerland, the Cantons are responsible for it (Pasternack, Maue, Hechler, Kolasinski, & Schulze, 2016, p. 164) with the exception of the two Federal Institutes of Technology⁸⁸. Furthermore, both countries have a strong and renowned higher education and science system in place. In the case of Switzerland, this is remarkable considering its “*small scale*” (Fumasoli & Lepori, 2011, p. 164). Switzerland’s research output is above average and this can be explained by factors such as the “*high endowment of financial resources and personnel*” (Fumasoli & Lepori, 2011, p. 164; Lepori & Fumasoli, 2010). Moreover, Switzerland is viewed as highly innovative (Hotz-Hart, 2012) and has produced a high number of Nobel prize winners. Germany also has a strong reputation regarding higher education, research and innovation. It is characterised by a fragmented and differentiated system (Edler, Kuhlmann, & Stegmaier, 2010) and strong academic self-governance (Simon & Knie, 2010). Both countries seem to perform well in terms of innovation. This is, for instance, reflected in their strong positions in international rankings, such as the Global Innovation Index (WIPO, 2021)⁸⁹. These aspects underline the similarities between the two countries, while there are also differences which will be discussed in the next section.

5.2.4.2. Differences Between Germany and Switzerland

There are a number of differences in terms of their structural characteristics such as country size (Chong, 2007). Switzerland is significantly smaller in terms of its territorial size, its population size, and the capacity and set-up of its administration, to name a few aspects⁹⁰. What is more, the diplomatic capacities of smaller states are also limited in terms of resources (Thorhallsson & Bailes, 2016). Accordingly, a different starting position can

88 The two ETHs (*Eidgenössische Technische Hochschule*, the Federal Institutes of Technology), ETH Zürich and EPFL Lausanne, are under the auspices of the federal government (SERI) (Pasternack et al. (2016); Lepori (2008)). The remaining higher education institutions are in the administrative realm of the Cantons (cf. Lepori (2008); Lepori, Huisman, and Seeber (2014)).

89 According to the most recent ranking, see WIPO (2021), Switzerland ranks top (this has not changed over the past five years) and Germany ranks in 10th place.

90 The number of universities also differs between Germany and Switzerland; however, given Switzerland’s performance, this seems to be a minor aspect.

be assumed for the two case countries. However, according to Long (2017, p. 146), “[w]hat matters is not ‘size,’ however defined, but the relationships between states”. To pursue this further, scholarly literature assumes that small states must develop distinct strategies to secure influence and defend their interests. Soft power (cf. Nye, 1990) is identified as a meaningful strategy to that end. More specifically, soft power strategies are seen as distinct tools with which to compensate for and facilitate “*diplomatic mediation*” (Chong, 2007, p. 1). Small states are assumed to exploit “*special characteristics*” to secure their positions internationally⁹¹ and they apply soft power strategies to achieve this (Constantinou et al., 2016, p. xvi; Thorhallsson & Bailes, 2016). In addition, they seek a specific niche to convey an image (cf. Nye, 2008) and aim for “*enlargement of their presence in the international community*” (Chong, 2007, p. 8). To that end, science and technology are mobilised.

To give an example, in its recent foreign policy strategy, Switzerland refers to the potential of soft power and the need to reinforce its position to participate in geopolitical matters (FDFA, 2019). This strategy assigns a crucial role to the promotion of innovation and technology, which are distinct elements of Switzerland’s foreign policy (ibid.), and which are intended to characterise and reinforce its international position⁹². Accordingly, soft power is viewed as a key ingredient of Switzerland’s foreign policy, as well as a tool with which to enhance its visibility, transmit a certain image and ultimately push Switzerland’s agenda. Since its establishment, Swissnex has been considered in an ideal-typical case through which to portray the image of Switzerland as an innovative, technology-driven country (interviews SIW2, SIS2, SIS7).

Soft power is also a key strategy for Germany, although it is a larger country. The importance of soft power has also been mentioned in relation to geopolitical positioning. Its relevance is evident in the three-pillar struc-

91 To take the example of another small state, Luxembourg can be mentioned. The Luxembourgish higher education system is, for instance, known to be highly international, see Harmsen and Powell (2019).

92 Switzerland is well known for its long-term neutrality in international affairs, particularly throughout wartime (Habicht (1953); Fischer and Möckli (2016); Goetschel, Bernath, and Schwarz (2005)). This principle of neutrality seems to be deeply embedded in Swiss politics, and Switzerland positions itself internationally in this way (cf. FDFA (2019)). According to Gabriel, the Swiss position is characterised by a certain dualism, even asymmetry: Switzerland strives on the one hand to maintain its international political independence, while on the other hand, Switzerland is rather interdependent “*economically, scientifically and culturally*” (2003, p. 1).

ture of Germany's foreign policy. In recent years, focusing on soft power has become increasingly relevant (Maaß, 2013), as expressed by the strong focus on promoting Germany's culture and education. These elements are seen as reinforcing Germany's foreign policy strategy, while also conveying a certain image of the country. Despite their different sizes and foreign policy positions (Switzerland is known for its neutrality, which is not the case for Germany (Harnisch, 2013)), in both cases, soft power is viewed as a tool that contributes to wider political agendas and as a means of consolidating their international positions⁹³. In addition, Switzerland and Germany are both countries with few natural resources, which explains the need to deploy strategies which secure their international positions.

5.3. Data Sources

Qualitative data was collected for this thesis. This is motivated by its aim of understanding “*phenomena, social fields, subjective and collective experiences and the related meaning making processes [...] also applied to discover and describe issues in the field or structures and processes in routines and practices*” (Flick, 2018a, p. 47). More specifically, two main types of data sources were collected: 1) expert interviews, which were enriched by personal communications that provided background information and 2) (primary) documents (see Table 8). For triangulation purposes, internet research was also carried out. What is more, the research also included site visits to two national SICs and attendance at information sessions and SIC events, which also informed this study. Due to this mix of sources, it was possible to triangulate the research data and also to compensate for the limitations of each source type. The data collection process was organised in an iterative and explorative way. This strategy was adopted to accommodate the newness of the field and the object of study. The specific choices for the study's two main data sources (interviews and documents) will be outlined in the next section.

93 In terms of soft power, one would expect that this is even more relevant in Switzerland, in comparison to Germany, given its size. For illustration purposes, reference is made to the Global Soft Power Index (Brand Finance (2020)), which measures soft power among different countries. The report attests that both Germany and Switzerland score high in terms of deploying soft power strategies, while Germany ranks second in the overall ranking and well before Switzerland, which ranks 8th (while it ranks higher on aspects such as *reputation*).

Table 8 Overview: Data Sources

	Data Type	Use in the Analysis
Interviews	40 interviews (<i>July 2017–February 2021</i>) with knowledge carriers in Germany and Switzerland from a) the political level, b) key stakeholders, c) representatives of the various SICs. For more details, see the appendix. In addition, one interview with a Danish SIC took place.	Main source of information which a) make it possible to retrace the historical development of the SICs and b) serves as the basis for the analysis of key stakeholders' rationales.
Personal Communications	Several informal background talks and personal communications (<i>March 2017–May 2022</i>)	Insights serve as background information to the main sources of analysis and help to contextualise and triangulate.
Documents	Policy Documents and briefs from various ministries between 2009–2022; For more details, see the Appendix.	Gain insights into the political dimension and importance of the topic; main sources which inform the analysis of changing political rationales.
	Internal Policy Documents: the DWIH's conceptualisation (March 2008, August 2008)	Reconstruct the development and initial discussions of the DWIH.
	Miscellaneous documents related to the DWIH: management summary of the evaluation (2015), revised DWIH concept (2017), standing orders (2018), minutes of meetings (2019/2020).	Background information and contextualisation for the DWIH's institutionalisation.
	Miscellaneous documents: (political) speeches, press releases, newspaper articles etc. between 2006–2022.	These sources make it possible to contextualise and mirror the prevailing <i>zeitgeist</i> . They also triangulate interview findings.
Internet Research	Websites: websites of key actors and SICs	Facilitate the understanding of the role of key actors and collect relevant information.
Site Visits	Site visit to two SICs (<i>November 2017</i>)	Understand how SICs are set up in practice.
	Attendance of SICs' information sessions and events: DWIH information session (<i>July 2019</i>), Swissnex Day (<i>December 2019</i>)	Familiarise myself with SICs in practice, observe their self-understanding and reception among the wider community.

Source: created by the author.

5.3.1. Interviews and Personal Communications

Interviews and personal communications⁹⁴ serve as the main sources of information for a) tracing the development of SICs and b) identifying the key stakeholders' rationales for participating in them. Interviews were chosen as the data source here since they generate distinct insights, which would otherwise be difficult to acquire. This is due to the limited availability of other sources, such as documents (particularly in the case of Germany). Interviews are most frequently used in qualitative research (Mey & Mruck, 2007). Over time, its methodology has evolved towards different types of interviews, such as expert interviews, narrative interviews, discursive interviews and ethnographic interviews, to name a few. These interview types each have their own limitations and possibilities; furthermore, they differ in terms of how they are set up and their degrees of structuration (cf. Helfferich, 2011; Mey & Mruck, 2007; Roulston & Choi, 2018). This research opted for a combination of interview practices and drew on expert and narrative interviews. This choice can be explained by the dual intention of a) generating in-depth insights into selected aspects of the SICs' development (expert interviews) and b) providing sufficient room for the interviewees to reveal their perception of that process and their sense-making (narrative interviews).

To accommodate this duality in practice, the interviews were set up in a semi-structured way by drawing on a set of fixed questions. This is in line with conventional expert interview methods (Bogner & Menz, 2001; Flick, 2011). In addition, the interviews were conceptualised in such a way that they also allowed for narrative interview elements: respondents were encouraged to share their views and perceptions of aspects that they deemed relevant (Bevir, 2006; Helfferich, 2011). To give an example: questions were formulated in an open way, inviting respondents to share their experiences, whilst not imposing a certain view on them (cf. Soss, 2006; R. S. Weiss, 1994). To facilitate this, interviews followed a conversational style, which aimed to overcome the artificial interview situation. At the same time, this constituted a balancing act between focusing on ordinary language interviewing, which is a relevant aspect of narrative interviews (Schaffer, 2006), and also demonstrating familiarity with the context. The

94 Personal communications include emails and telephone conversations with individuals who are currently or were formerly involved in the respective SIC and inform this study. These sources will only be referred to occasionally.

combination of these two practices was adopted to ensure greater data validity. In the following section, the sampling methods are discussed.

5.3.2. Interview Sampling Method

For this study, knowledge carriers for SICs in their national contexts were relevant interview partners. More specifically, key stakeholders who were either involved in establishing SICs or who are currently involved in their operation were interesting partners as they had the potential to shed light on the development and use of SICs. Four groups of interview partners were identified: a) state officials, b) stakeholders in the German and Swiss science and research ecosystems, c) other actors involved in this field, and d) current and former SIC representatives. In line with the concept of snowballing, professional traits were decisive criteria in the recruitment procedure; these traits will be outlined in the next section (cf. Kristensen & Ravn, 2015). An iterative and inductive path characterises the data collection process; the topic was approached in an open and unprejudiced way, and there was leeway for slight adjustments following the initial results (drawing to some extent on ground theory principles). Accordingly, the interviews can be divided into two phases: the exploratory phase (phase I) and the consolidation phase (phase II).

5.3.2.1. Exploratory Phase (Phase I)

The research began with an *exploratory phase (phase I)* to acquire a better understanding of the instruments at hand and gain access to the field. To start with, an interview matrix was prepared, which identified key knowledge carriers and stakeholders who were involved in the SICs' development. This matrix was created by reviewing publicly available documents, such as (annual) reports, speeches and organigrams. In the case of Germany, creating the matrix proved to be challenging as until 2017, there was limited publicly available documentation regarding the DWIH (this is not surprising in light of its development process). Accordingly, this step was time-consuming, and it was difficult to identify relevant knowledge carriers and stakeholder structures. However, this step was crucial for gaining access to the field and navigate into the SICs' actor landscape (cf. Bogner & Menz, 2001). Based on this matrix, an initial set of nine interviews as well as personal communications were held; in order to gain

a better understanding of SICs and compensate for the lack of other data sources, such as documents. These interviews served as an entry point and prepared the way for more consolidated data collection. Furthermore, the interviews allowed for the snowballing principle (cf. Goodman, 2011) to occur, since interview partners pointed to distinct developments and the role of key actors. This in turn expanded the matrix of potential interview partners.

5.3.2.2. Consolidation Phase (Phase II)

The bulk of the fieldwork was carried out between January 2018 and February 2021 (*phase II*) (see Table 9)⁹⁵. During this phase, **31 interviews** were conducted with knowledge carriers from the four distinct actor groups which were described earlier. The interviews again enabled refinement of the initial matrix of potential interview partners. The majority of the interviews were held face-to-face, while a few also took place on the phone. More specific information about the interviews, such as the length and date, are listed in the appendix⁹⁶.

95 Please note, a few background talks took place even after February 2021.

96 See Appendix 1 and Appendix 2.

Table 9 Overview: Interview Sample

Country	Number of Interviews				Total
	State officials	Science sector	Other actors	SICs	
Denmark				1	1
Exploratory phase (July 2017–December 2017)					
Germany	2	4			6
Switzerland	2			1	3
Consolidation phase (January 2018–February 2021)					
Germany	4	10	1	4	19
Switzerland	4	5	1	2	12
Total	12	19	2	8	41

Source: created by the author.

For the sake of transparency, it should be mentioned that around 15 interview requests were unanswered or were declined. Potential interview partners were either unavailable timewise, were not willing to participate or simply did not respond. The data collection process was impacted by “gatekeepers” (Wanat, 2008). To give an example, while the matrix made it possible to identify stakeholders, it was sometimes difficult to approach them as, in some cases, no contact details were publicly available. In these situations, third parties were asked for assistance; they either provided contact details or forwarded the interview request to the actors (due to data protection and privacy issues). While these attempts were successful in some cases, in others they led to a dead-end as the potential interview partners did not respond to the enquiries. In addition, for the DWIH, gatekeepers were encountered even in cases where a key actor had already

agreed to an interview. More specifically, key actors who are involved in the daily management of SICs initially agreed to an interview; however, they later withdrew their offer on the instruction of their superiors. Instead, hierarchically more senior staff members were assigned to participate in the interview. This appeared to be an issue of ensuring that the official viewpoint was communicated (ensuring uniformity) and not leaving things to interpretation (prerogative of interpretation). This gatekeeping certainly shaped the interview composition; however, it is difficult to establish to what extent it impacted the quality of the data (presumably this limited the critical perspectives on the day-to-day management of the SICs).

5.3.3. Interview Processing

All interviews were audio-recorded and transcribed. The transcription followed the “easy” transcription guidelines stipulated by Dresing and Pehl (2017, pp. 21–23) to ensure better legibility. A few interview partners wished to receive a copy of the transcription and give their approval. This (largely) proved to be only a formality. In a few cases, the interviews were not audio recorded since the interview partners did not give their consent. Their reasons for doing so align with scholarly findings on opposition to audio recordings, such as discussing sensitive information, inhibitions and fears about saying something that is not in line with official positions (Vogel & Funck, 2018). In the few cases where interviewees did not agree to be audio recorded, notes were taken and transformed into interview protocols and postscripts. Vogel and Funck (2018) argue that drawing on interview protocols does not necessarily constitute limitation of data quality; instead, it might be a conscious and deliberate research strategy of its own. Once the interviews were transcribed, they were processed and analysed using MAXQDA software to facilitate efficient data handling.

5.3.4. Documents

Documents were the second main data source in this research: substantive primary and secondary documents were collected to trace the development of SICs over time and to enable triangulation. Documents were used as a distinct data source in order to analyse the political objectives associated

with SICs. More specifically, the following documents were collected (see Table 8): policy documents and briefs from various ministries, internal policy documents and miscellaneous secondary documents relating to the two SICs (such as evaluation reports, procedural rules and minutes of meetings). In addition, (political) speeches, press releases and newspaper articles were sampled. The availability of documents, however, differs between the two cases. The Swiss case reflects good coverage over time. Insightful documents are, for instance, the official *Botschaft*⁹⁷ documents. In comparison, the documentation on the DWIH was scattered and largely incomplete, until 2017. Hence, the constraints that are identified in scholarly literature, such as differing levels of completeness, the availability and quality of the documents as well as differing target audiences, also apply here (Bowen, 2009; Rapley & Rees, 2018)⁹⁸. The methods of data processing and forms of analysis are outlined in the following section.

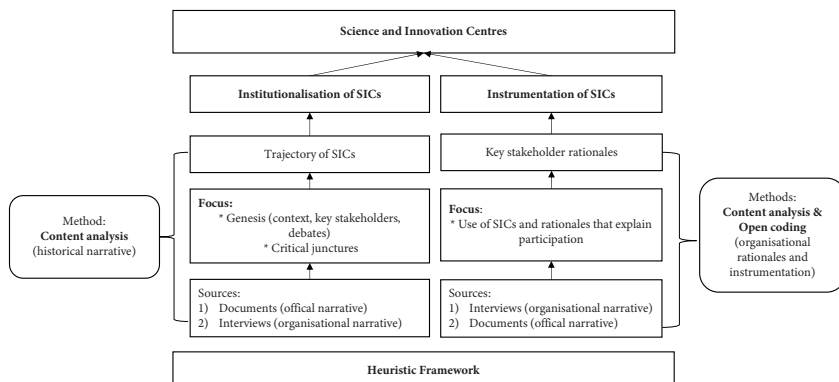
5.4. Data Analysis (Multi-Method)

The data was processed in line with the research design (section 5.2) and the overarching analytical framework. The framework (see Figure 5) organises the different data sources and methods of analysis around the key components of SICs' *institutionalisation* and *instrumentation*. The distinct role of interviews and documents in contributing to an understanding of the development of SICs and their instrumentation was highlighted in the previous sections. A tailor-made data analysis was conducted; this mainly draws on two methods, which are applied for each case study: content analysis and open coding. In other words, each case study follows this distinct logic.

97 *Botschaft* documents are official policy documents which specify the political goals and set the overall strategic direction and vision for the respective legislative periods, while also clarifying matters of funding. The Federal Council (*Bundesrat*), i.e., the highest executive body in the administration, prepares these documents every four years for the parliament. In this context, the *Botschaft* for the promotion of education, science and innovation is most relevant (*Botschaft zur Förderung von Bildung, Forschung und Innovation*, BFI-Botschaft).

98 See the Appendix for an overview of which specific documents were collected and analysed.

Figure 5 Analytical Framework



Source: created by the author.

5.4.1. Content Analysis

Content analysis is used as a strategy to analyse the development of the German and Swiss SICs and present the historical narrative. Content analysis is defined as the “*the process of organising information into categories related to the central questions of the research*” (Bowen, 2009, p. 32). To that end, relevant insights that point to the origins of the development of SICs were extracted in a systematic way across the two main data sources (interviews and documents) (cf. V. Braun & Clarke, 2006). More specifically, key dates and actors were identified, as well as the main points of discussion and contextual factors; this corresponds to the heuristic framework. In a second step, the information was organised and a sense-making activity took place; key events were arranged historically on a timeline (see Figure 6 & Figure 12 for a refined version of these findings). This process created a body of evidence. Furthermore, a continuous sense-making exercise and validation was carried out for the official data sources (documents) and the narratives which were presented in the interviews. Where applicable, ambiguities between the two sources are identified in the data presentation. Furthermore, content analysis has also been used to analyse the political objectives connected to SICs and to identify changing themes (see sections 8.1 & 11.1). Documents were used as the primary source for this analysis.

5.4.2. Open Coding: Gioia Methodology

The instrumentation of SICs was analysed by applying an open coding exercise based on the Gioia methodology. The Gioia method provides an inductive path to data analysis (Gioia, Corley, & Hamilton, 2013) in a more systematic and structuring way than content analysis; this method makes it possible for a researcher to examine the spectrum of rationales that guide actor participation in SICs (rather than discussing this per actor). The analysis followed three steps, which each increase in terms of the level of abstraction and provide a distinct data structure (examples of this can be found in chapter 8).

First, an open coding process was carried out to create first-order concepts (Gioia et al., 2013, pp. 21–22): interview passages that are relevant to the underlying research interest were coded. More specifically, those text passages were coded in which interview partners either gave reasons for their participation in SICs or explained why SICs are useful⁹⁹. In addition, distinct examples of specific use were coded, as were those cases which mentioned limits to participation. The interviews also included an avenue of reflection which addressed the hypothetical situation of closing SICs¹⁰⁰. This made it possible to identify the perceived importance of SICs, while also providing further insights into actors' sense-making. Labels were created for the passages that adhere to the original wording of the interviewees as far as possible. Since this step took place inductively, the coded extractions mushroomed: for example, in the German case study, the first analytical step led to 67 different codes and 450 text passages that were coded across 14 interviews. To reach a more manageable number of codes, the initial coding exercise was shaped by an iterative systemisation process to condense the insights: going back and forth between the interviews and

99 The analysis largely relied on self-reported actor rationales. This might be subject to certain bias, such as the intention to look better, and will be elaborated in the next section. To compensate for this, annual reports from key stakeholders were selectively analysed to reveal actors' participation and work triangulating to the self-reported use.

100 This counterfactual approach is seen to be a useful tool which sheds light on the (perceived) added value of the instruments or its effectiveness. This is elaborated in more detail in section 13.5.

codes took place to a certain extent, which led to the regrouping or merging of codes¹⁰¹.

In a second step, these concepts were considered on a higher and more abstract level, and aggregated second-order themes were formed. Finally, the data was organised into aggregate dimensions, which provided an even higher level of abstraction to the initial categories. These three steps generated a distinct data structure that provided reasons why actors engage with SICs. The analysis is visualised in a data structure (see chapters 8 and 11) which, according to Gioia, is presumably the most “*pivotal step in our entire research approach*” (2013, p. 20) since it transparently shows how the raw data is processed and analysed.

In the German case study, 14 interviews were analysed¹⁰² with 11 different actors (out of a total of 17): 10 key stakeholders and one chair of a local advisory body. In the Swiss case study, five interviews were analysed: three actors that are institutionally involved in the Swissnex Committee and two representatives of higher education institutions¹⁰³ that reflect the client-focus. The number of interviews differ between the two studies; this can be explained by natural conditions that derive from a comparatively smaller system as well as Swissnex’s different set-up and its actor involvement (see section 9.1), as well as non-responses to interview requests. While the German SICs involve multiple actors and stakeholders, the Swiss system is organised differently and is comparatively smaller. This, in turn, also impacts the number of potential interview partners (and stakeholders). These conditions account for the diverging numbers of interviews; however, they do not impact the quality of the data and it is still possible to draw valid conclusions.

101 The literature is indifferent on how strictly a coding structure should be developed to conduct rigorous qualitative research. For instance, Gläser and Laudel (2013) support modifying coding categories throughout the coding process, while other scholars, such as Schreier (2014), propose a sequential approach and argue in favour of sticking to a fixed scheme of categories at a certain point in the analysis.

102 With some key actors, multiple interviews and informal background talks took place. This will, however, not bias the results and is accounted for in the data analysis and the subsequent data presentation.

103 Four additional institutional stakeholders from the Swissnex Committee were approached to participate; however, requests were declined or remained unanswered.

5.5. Conclusion and Reflection

This chapter presented the distinct methodological choices which underpin this research. In terms of transparency, certain choices and set-ups also pose limitations and this requires consideration. In general terms, drawing on interviews and documents as data sources presents certain limitations that also apply here (see for interviews for instance Flick, 2018b; Helfferich, 2011; Kothari, 2004). Among these limitations are, for instance, interviewees' memories. Memories may be selective and skewed, and they may also be limited by stakeholders' attempts to present themselves in a positive light in retrospect. This might also hold true in relation to the self-reported use of SICs. This limitation is acknowledged and can be balanced out by drawing on multiple interviews and consulting the document types which were described earlier to validate these findings. In a similar vein, interviewees were asked to speak on behalf of their organisation. However, it is not possible to check to what extent interviewees consistently adhered to this request. Potentially, individual opinions may have nevertheless found their way into the interviews. These limitations were attempted to be controlled for by stressing that the view of the organisation should be conveyed in the interviews. What is more, additional documents (such as annual reports) were consulted and internet research was conducted to account for these limitations and facilitate triangulation. In addition, the gate-keeping restrictions and the denial of access to certain interview partners (as mentioned in section 5.3.1) should be mentioned as factors that limit, or at least shape, the exact composition of the data.

Finally, the interview process itself might be biased by the interviewer's role, which may impact the quality of the data (see Kothari, 2004, p. 99). For instance, questions might be formulated in a way that pushes the interview in a certain direction or the researcher may become a dominant interviewer (Mey & Mruck, 2007) rather than an active listener. The researcher's awareness of these potential biases is seen as a strategy to minimise the impact of such bias. In addition, the immediate and continuous transcription of the interview material inevitably triggers a process of self-reflection on how the interviews were conducted. To sum up, different strategies were devised to accommodate the limitations that the research design and methods entail. These strategies were thoroughly applied in order to ensure that rigorous qualitative insights can be provided. The next chapter presents the empirical findings, starting with the German case study.

