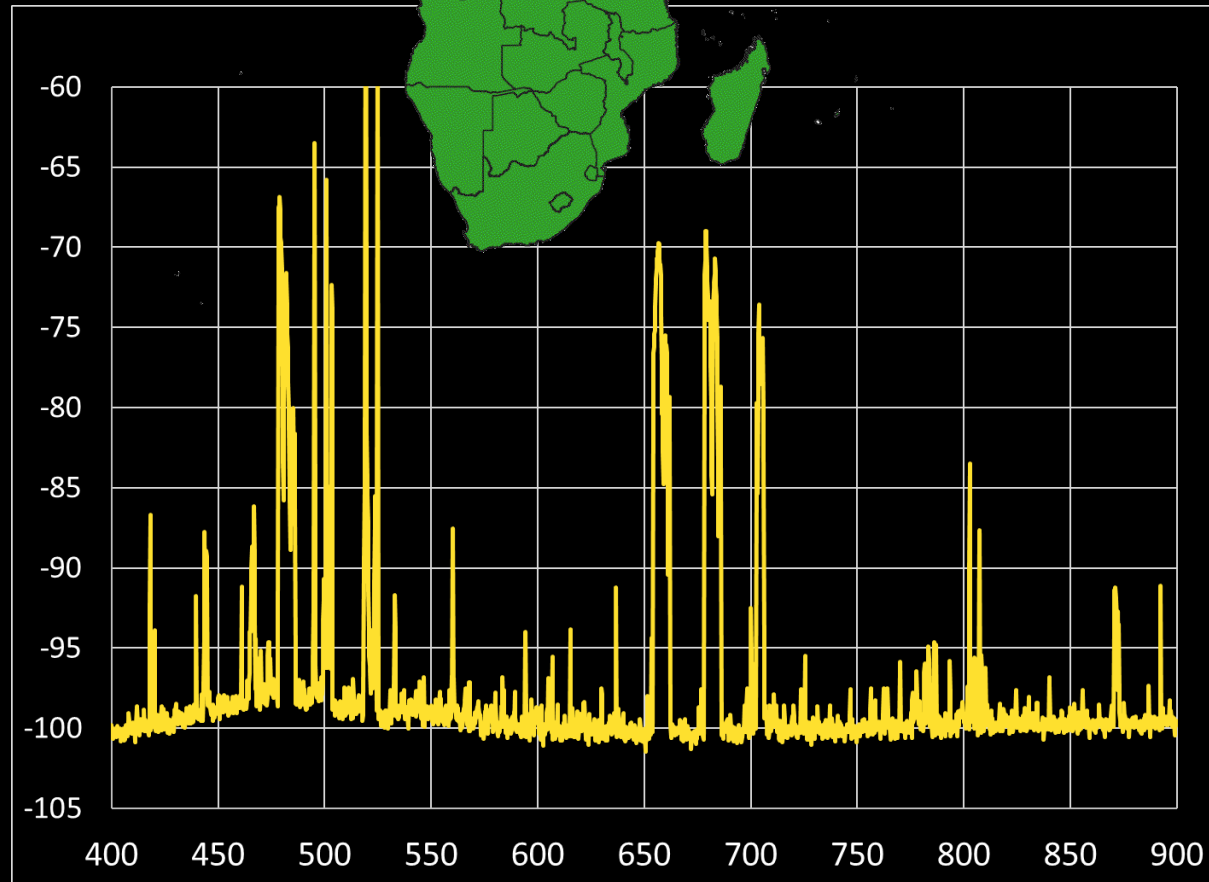


Governance and spectrum demands for broadcast and mobile services in the ultra-high-frequency band in the Southern African Development Community



Off-air spectrum measurement – Lusaka, Zambia (2017-03-30), plot by author

Oral presentation on a thesis manuscript submitted to the Faculty of Humanities, University of the Witwatersrand, in fulfilment of the requirements for the PhD in Interdisciplinary Digital Knowledge Economy Studies

Gerhard Petrick
Student Number: 28244

Supervisor:
Lucienne Abrahams (PhD)

6 May 2026

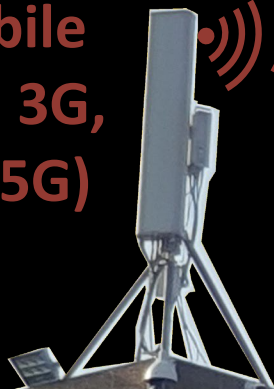
Overview

1. Errata
2. Highlights for the abstract
3. Research problem, research purpose, main research question
4. Literature review
5. Capture theory
6. Methodology
7. Analysis and moving towards A contextual capture theory of international spectrum governance
8. Overview of data chapters
9. Analysis highlights
10. Contribution to theory
11. Limitations and future work
12. Significance and originality
13. Q&A

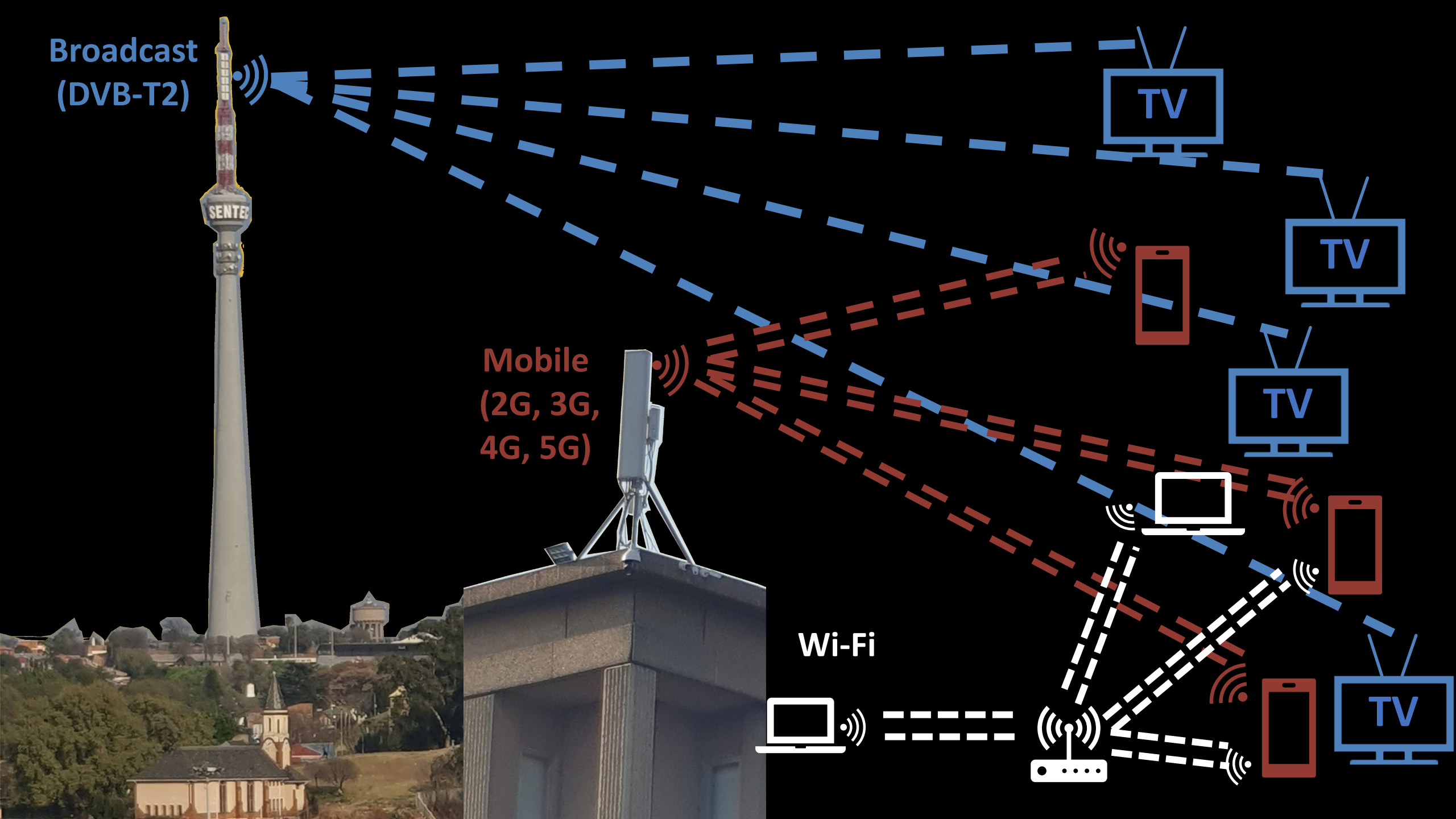
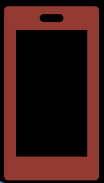
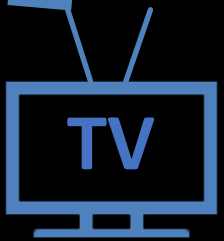
Broadcast
(DVB-T2)



Mobile
(2G, 3G,
4G, 5G)



Wi-Fi



Spectrum Allocation Decisions

World Radiocommunication Conference (WRC)

of the International Telecommunications Union (ITU)

- 4-year study-cycle
- Final 4-week conference
- 3986 participants
- 163 Member States

Radio Regulations



Update of the Radio Regulations

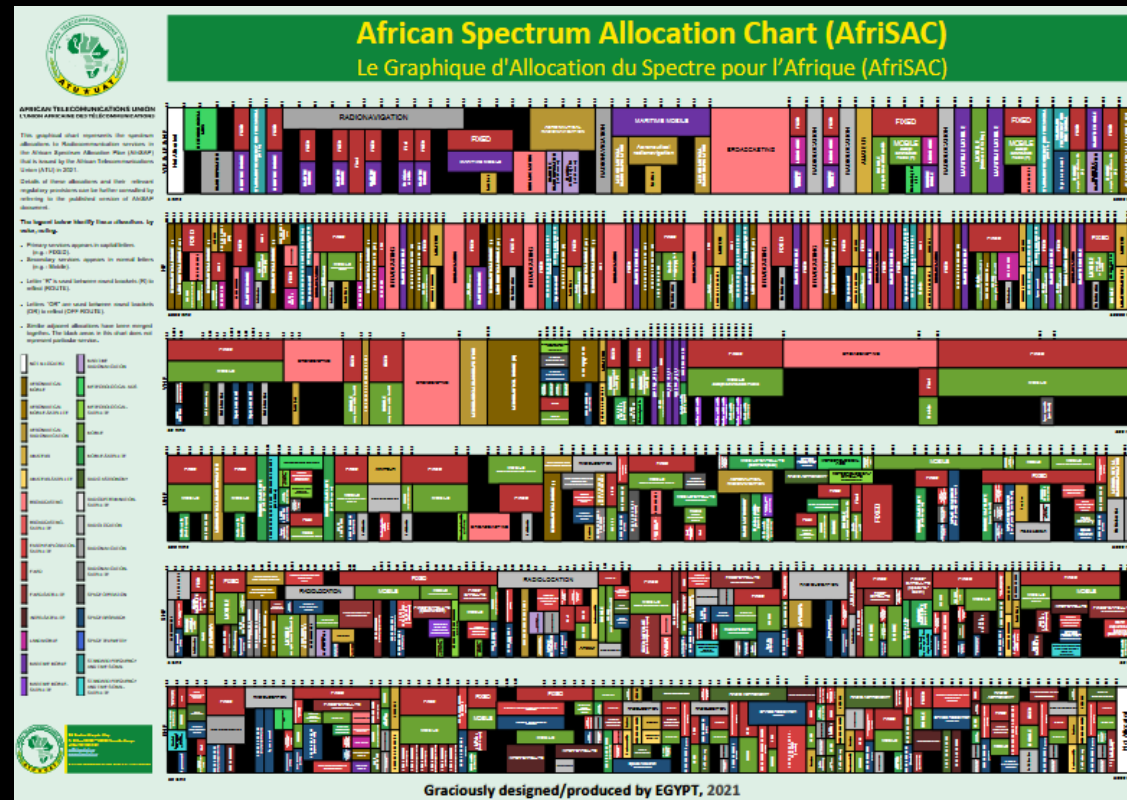
“Spectrum Allocation” a prerequisite for national licensing

Radio Regulations



Update of the Radio Regulations

Regional and National Frequency Plans

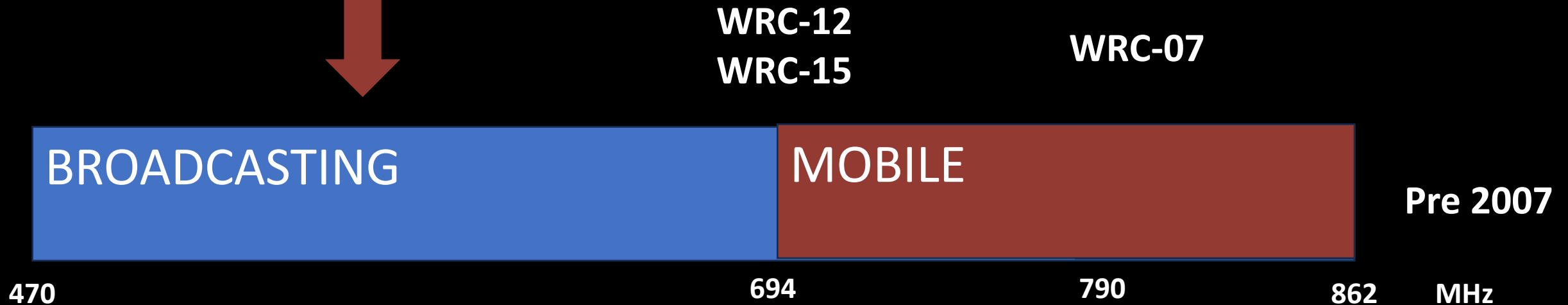


National frequency spectrum licensing



The ultra-high frequency (UHF) band

More demanded



WRC-23

Agenda Item 1.5

Highlights from the abstract

- International spectrum allocation decisions are technically and procedurally complex
- A range of legitimisation and public interest matters arise on the governance front
- The UHF band discussion interrogates needs and requirements for broadcast and mobile services
 - Highly disparate services and ecosystems engage: Broadcast and mobile
- Contextual Interaction Theory
- Capture Theory
- A Contextual Capture Theory of International Spectrum Governance

Research problem statement



- Spectrum allocation decisions (SADs) are
 - Multifaceted, complex, with blurred lines of responsibility
 - International policy-making decisions (ITU-R Region 1 of SADC countries)
 - Taken amidst rapid technological advancement and changing consumer behaviour
 - To be informed by an assessment of spectrum use and needs challenged by the nature of services, regulatory framing and disparate recourses to influence
 - Impactful on long-term spectrum use and the public interest
- Theoretical, legislative and regulatory framing is predominantly on national spectrum assignment
- Knowledge gaps: on what basis are SADs made, what informs SADC administrations

Research purpose

To provide **insights** into:

- i) The **process** that is followed in deriving a national, sub-regional (SADC), regional (ATU) and supra-regional (ITU-R Region 1) position on a SAD for a specific band
- ii) The **aspects that need to be analysed** to derive the spectrum needs for mobile and broadcast and
- iii) The **roles, responsibilities** and **capacities** required

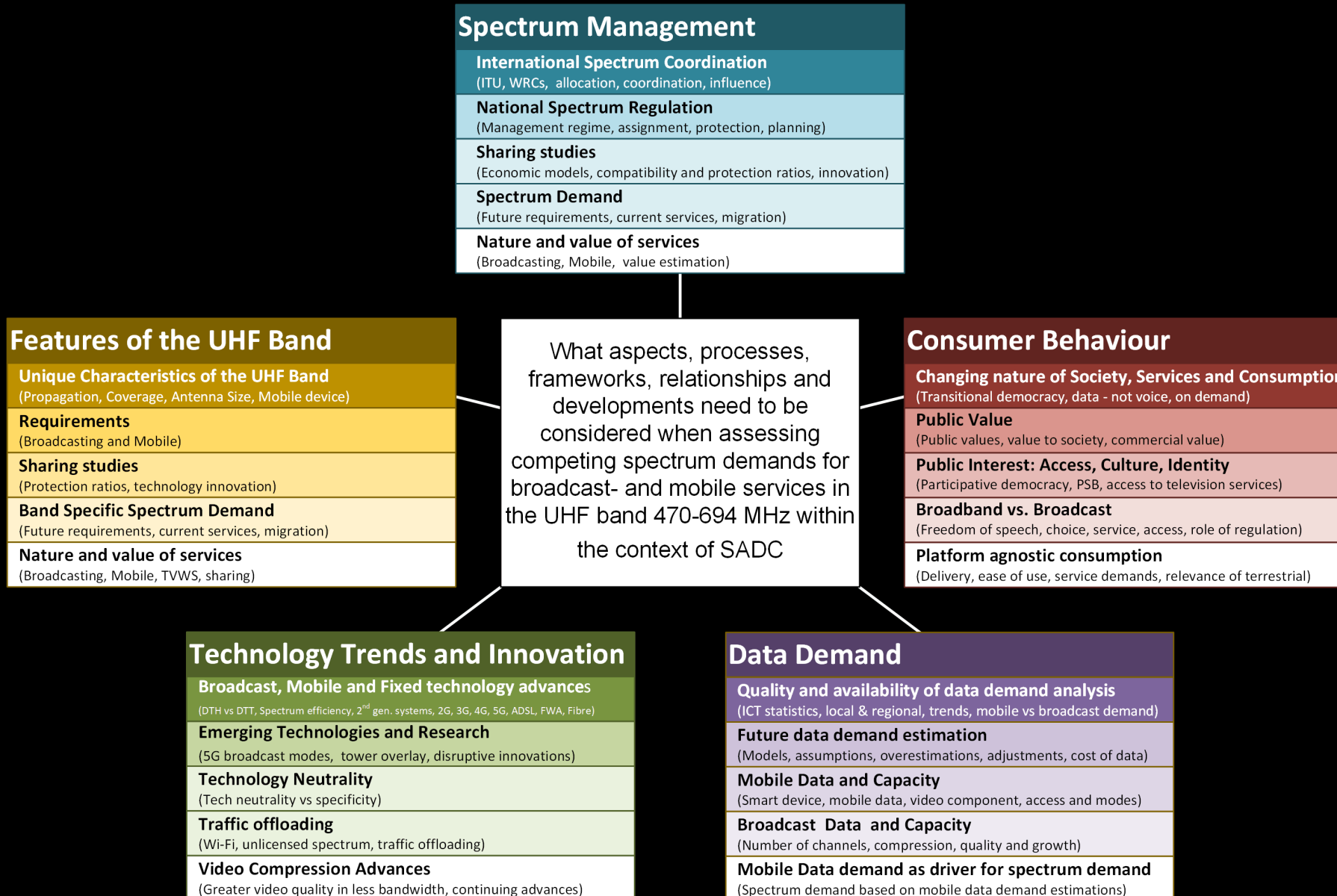
To **contribute** to:

- iv) **Spectrum management activities in the region** and in particular WRC-23 AI1.5 (and WRC-27, WRC-31)
- v) **Theory** and **practice** towards making SADs
- vi) **Knowledge building** and theory in the field
- vii) **Publication** of results and findings as appropriate

Main research question

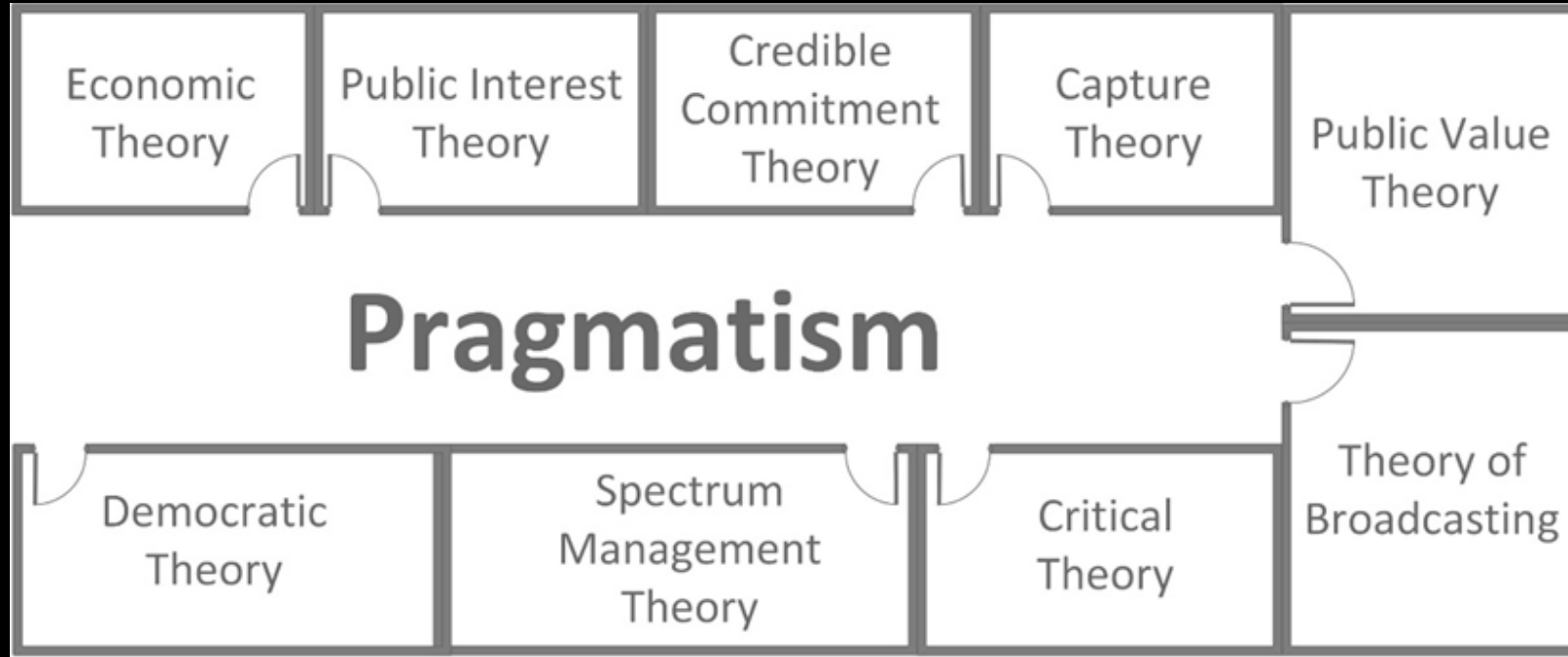
What aspects, processes, frameworks, relationships and developments need to be considered when assessing competing spectrum demands for broadcast and mobile services in the UHF band 470-694 MHz within the context of the Southern Africa Development Community (SADC)

Literature review: Technical review (Phase 1)



I anticipated that the application of economic and engineering theory would address the research question

Literature review: Corridor of theory (Phase 2)



Author's illustration of theoretical fields considered relevant to this research based on Papini's perspective of pragmatism as corridor in a hotel allowing passage to the respective fields of theory being studied (James, 1907b, p. 54).

I found that several theories are relevant, applicable, intersect with, and have a direct bearing on this research

Encouraged towards focus and parsimony I landed on

- Capture Theory (CT) and
- Contextual Interaction Theory (CIT)

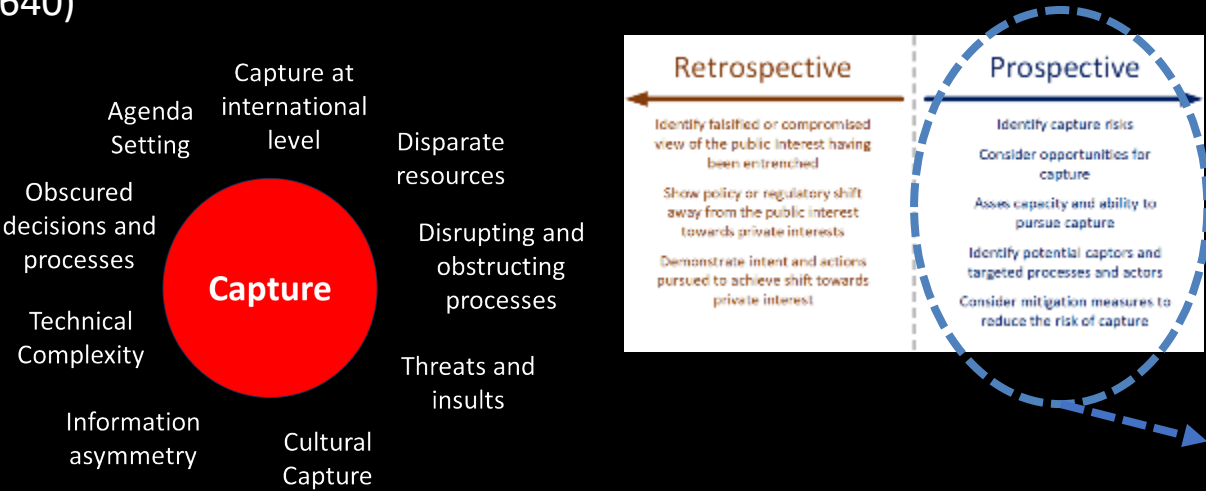
Capture Theory

“a regulatory commission tends to be captured by the industry it regulates” (Coase, 1966, p. 442)
(...) as a rule, regulation is acquired by the industry and is designed and operated primarily for its benefits (Stigler, 1971, p. 3)

Empasis is given to the need to

- 1. Present the entrenchment of a **falsified** perspective on the **public interest** to be served
- 2. **Show a policy shift** or regulatory change towards private / industry interest
- 3. Prove action and **intent** to capture **by the regulated**

(Alves de Lima & Massard da Fonseca, 2021; Carpenter & Moss, 2013, p. 14; OECD, 2017; Rilinger, 2023, p. 45; Weinkle, 2020, p. 640)



Material capture

is ascribed to interactions between regulators and the regulated in a market (Rilinger, 2023, p. 45) and includes the concept of capture by erecting entry barriers (Stigler, 1971) and the currently pervasive “corrosive capture” (Carpenter & Moss, 2013, p. 16) that dismantles regulation (Rilinger, 2023, p. 45)

Cultural capture

considers regulators actively in pursuit of the public interest but with an influenced or distorted view of what this is and an inability to detect problematic behaviour drawing the agency away from the public interest focus and action (Rilinger, 2023; Weinkle, 2020)

Policy capture

is the process of consistently or repeatedly directing public policy decisions away from the public interest towards the interests of a specific interest group or person (OECD, 2017, p. 9)

Factors to assess in deriving the risk of capture (OECD, 2017, p. 39)

Opportunities for policy capture	Ability and capacity to exert undue pressure
a) Level of unchecked and unaccountable discretion b) The degree of technical complexity of the topic and decision-making process c) Transparency and accountability in decision-making	a) Access to and availability of resources to influence b) Inequalities and degree of concentrated power to extract rents c) Extent to which benefits accrue d) Stable networks in which to pursue capture e) Expectations of reciprocal favours being exchanged

Gaps in Literature

- Coverage of spectrum allocation is scarce and limited in scope
- Literature on spectrum management and governance of spectrum decision-making gravitates towards spectrum assignment and the economic, engineering and service aspects national regulators engage on
- Perspectives from Africa by African researchers are limited and literature on spectrum allocation with a SADC perspective rare

Spectrum allocation	An international administrative process that agrees what radiocommunication services are to use which portion of the radio frequency band and under what conditions
Spectrum assignment	A national activity that licenses radio frequency spectrum to users
Spectrum allocation decision (SAD)	The culmination of a 4-year study-cycle and a decision of a World Radiocommunication Conference (WRC) to allocate radio frequency spectrum to a service

Methodology

- Approaches encountered
 - Strongly mono/multidisciplinary perspectives
 - Disembedded from the social and political spheres
- Own perspective initially multidisciplinary
 - Keeping within the “skins” of the disciplines
 - Not able to integrate
 - Not able to answer the research questions fully
- Subsequently pursued “deep interdisciplinarity”
 - Actively seeking out, integrating and mixing engineering, economic, social and political fields
 - Value found in looking “behind the facts” and “beyond the horizon” of the respective discipline
 - Aspirational towards a transdisciplinary approach



a) Monodisciplinary
(Stand-alone)



b) Multidisciplinary
(Additive)



c) Interdisciplinary
(Interactive)

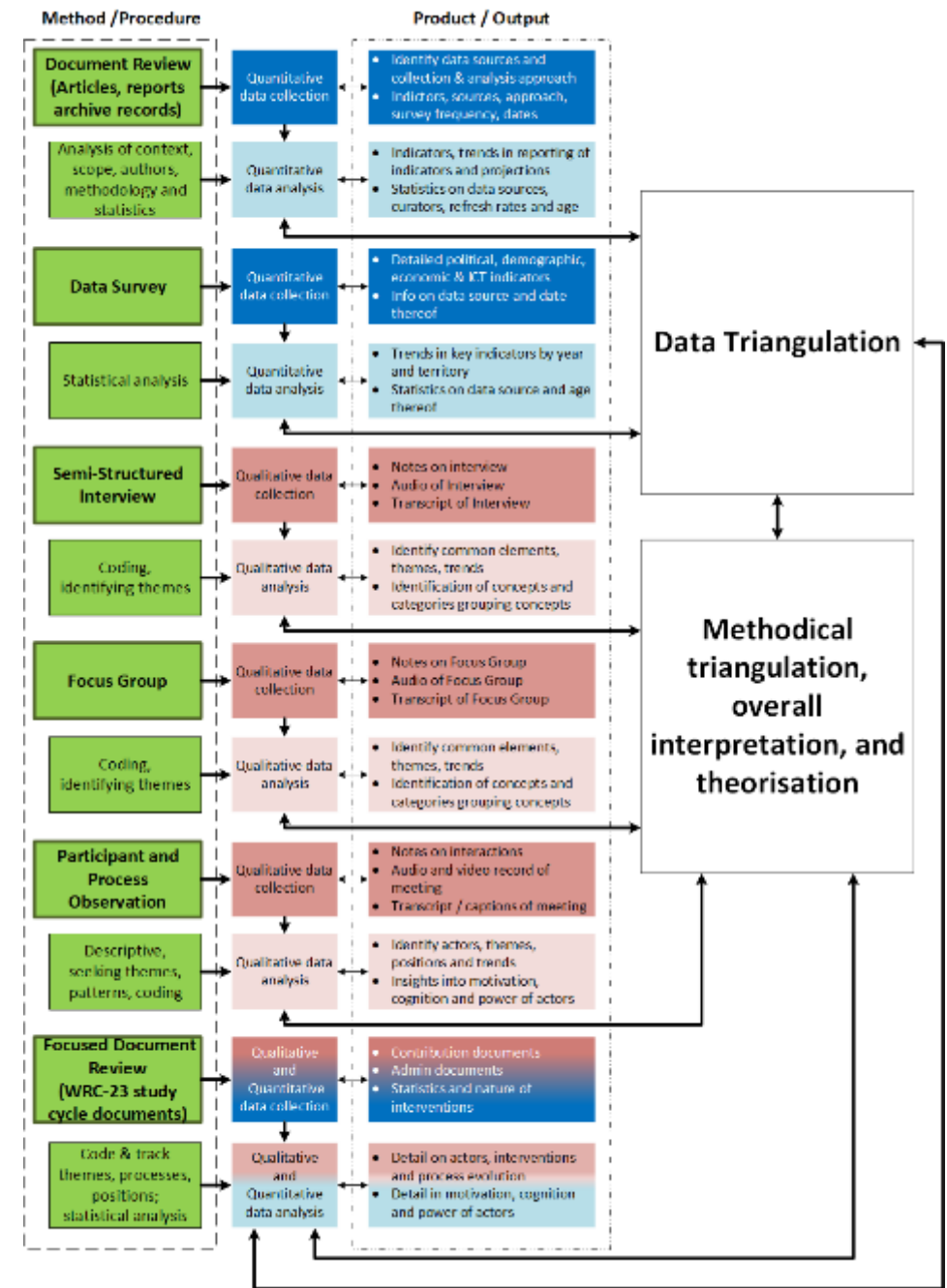


d) Transdisciplinary
(Holistic)

Author's visualisation of the food analogy for research approaches by Nissani (1995) and Flus, Grove and Schoneveld (Flus et al., n.d.). The bracketed common descriptive words for multi-, inter-, and transdisciplinary are from Choi and Pak (2006, p. 351).

Methodology

- Originality targeted
 - SADC perspective
 - Band-specific focus
- Ontology
 - Pragmatic, critical and complex ontology
 - Acknowledging divergent views
 - In pursuit of emerging horizons
- Epistemology
 - Acknowledging that different epistemologies are being pursued
 - Need for rigour in interrogating claims of knowledge
 - Triangulation
 - Data
 - Investigator
 - Theoretical
 - Methodological
- Axiology
 - Formulated axiological perspective by research intervention – assessing the benefit and ethical risk
 - Continuously checking-in on own values, biases and their impact
 - Re-shaping the researcher's selfhood towards embracing and respecting otherness and difference

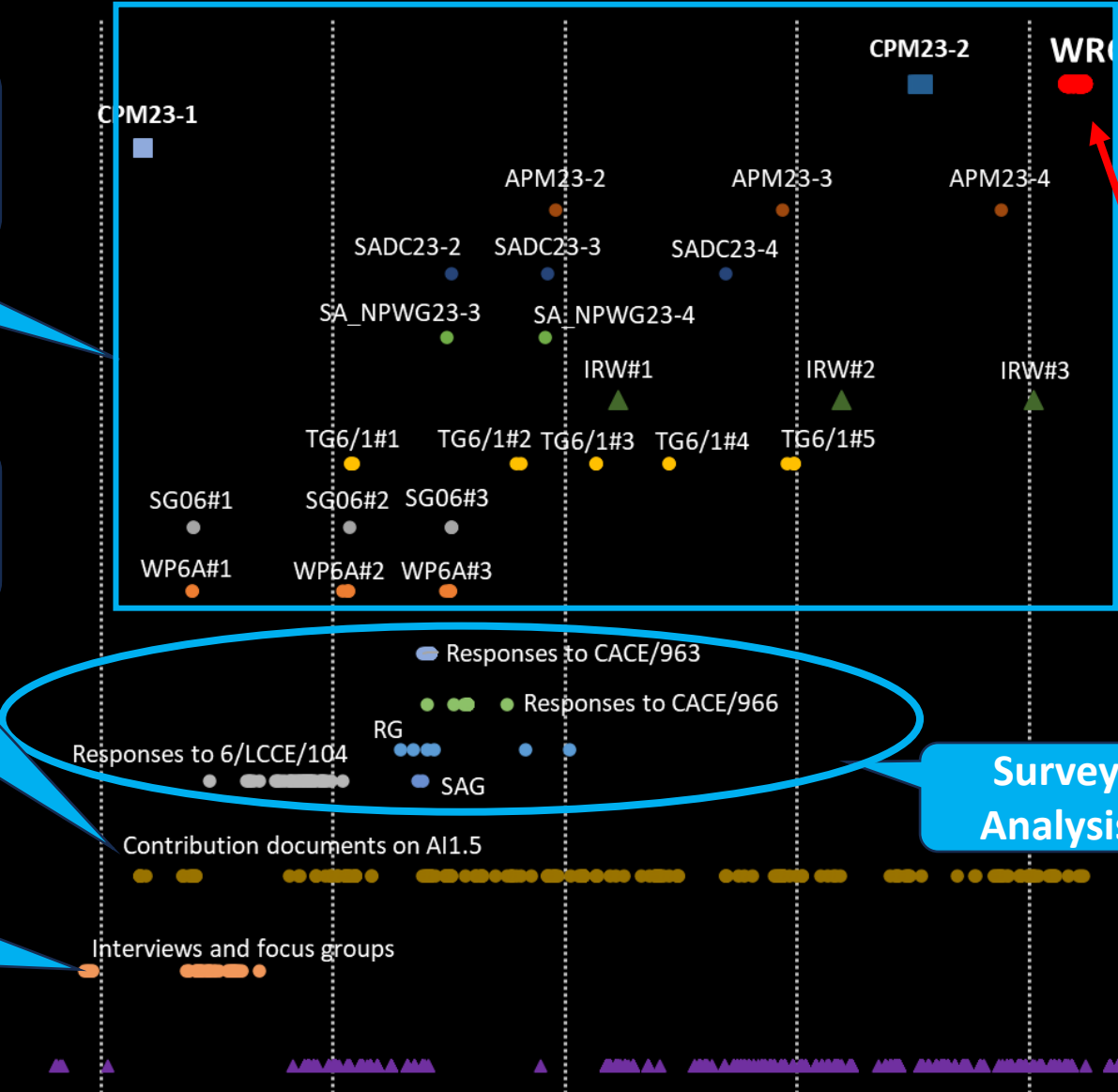


Data collection methods and time-lines

Participant and process observation, insight only, no data
114 meetings

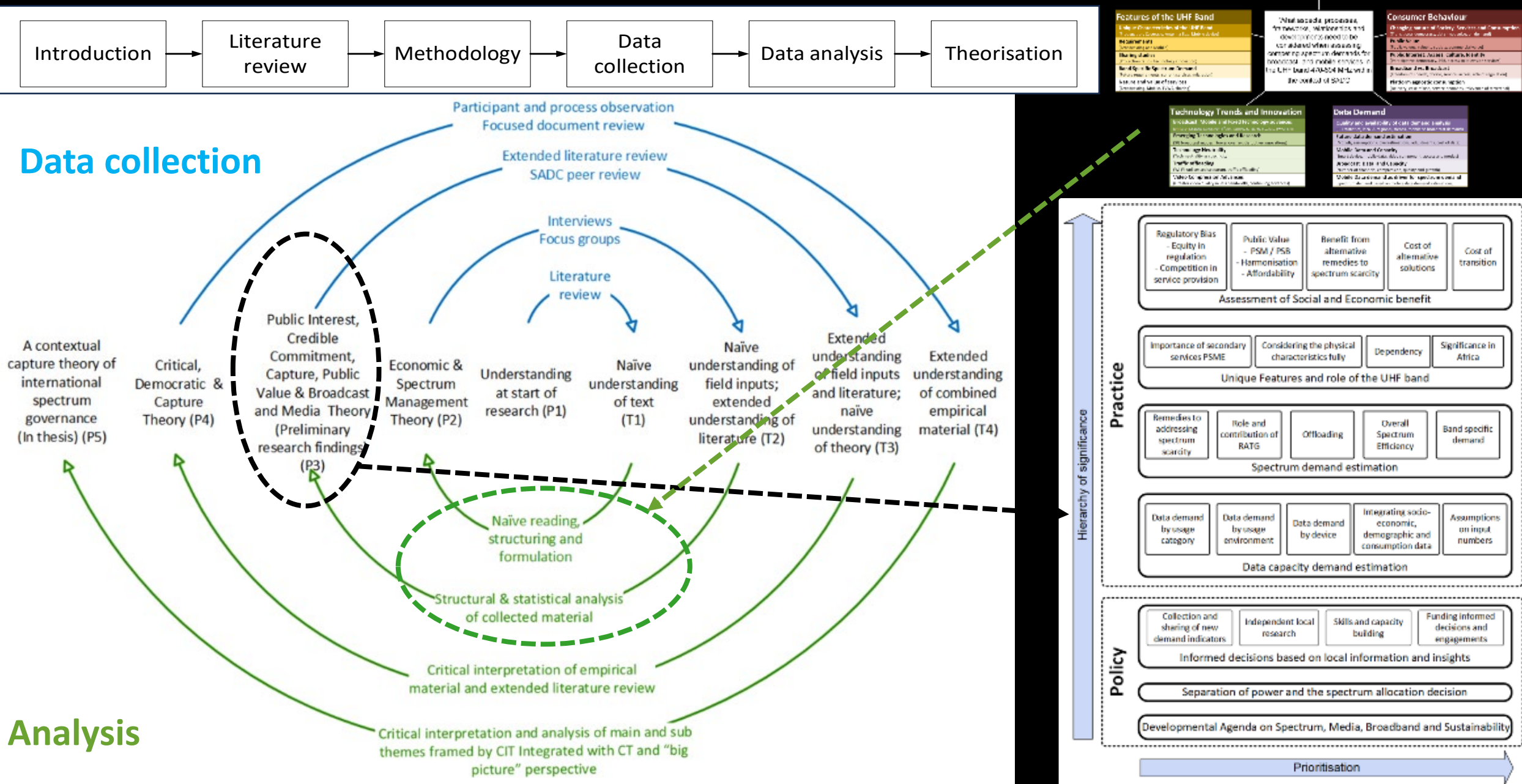
Document review
869 research papers
386 contribution documents on AI1.5

Expert engagements
36 semi-structured interviews
3 focus groups

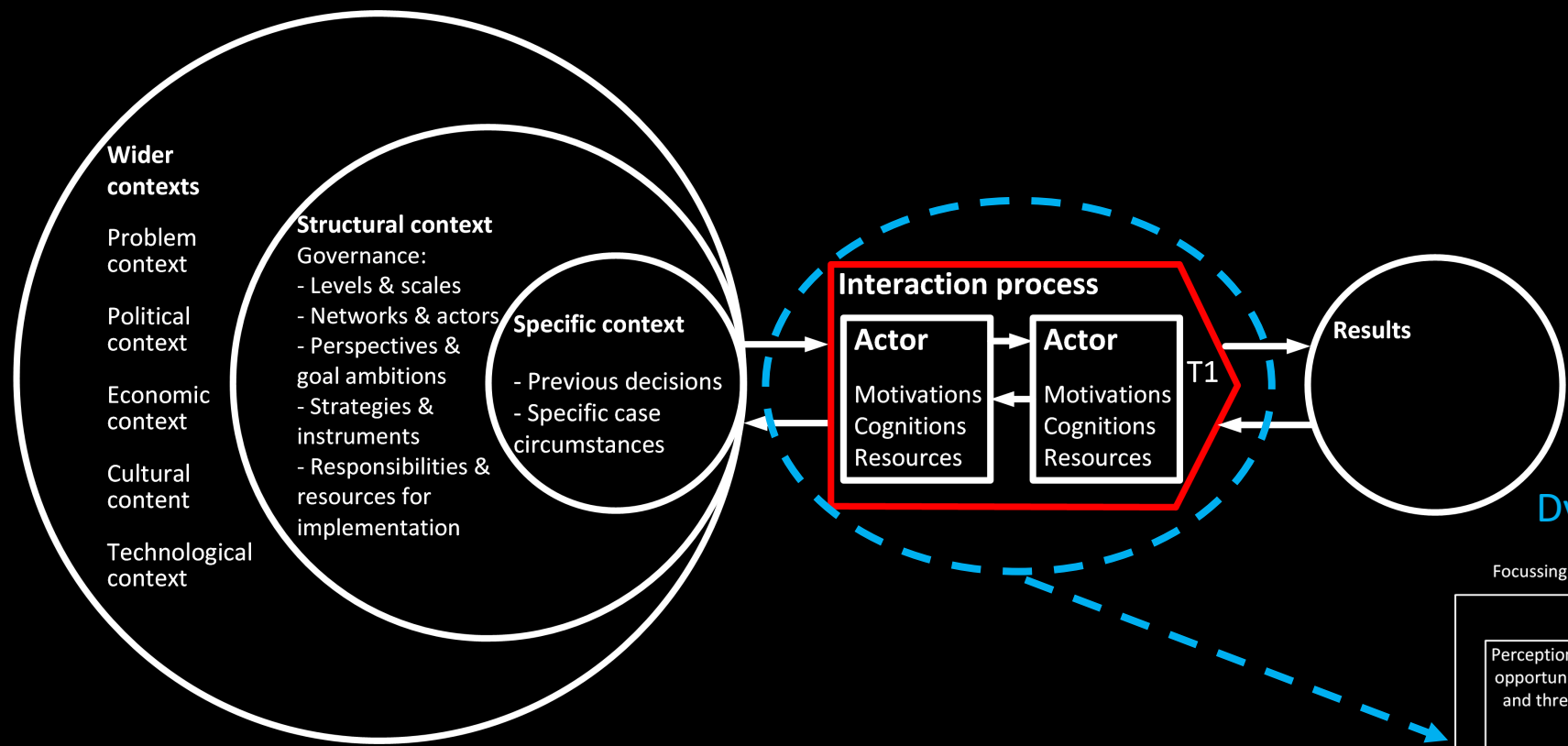


WRC-23
20 November to 15
December 2023

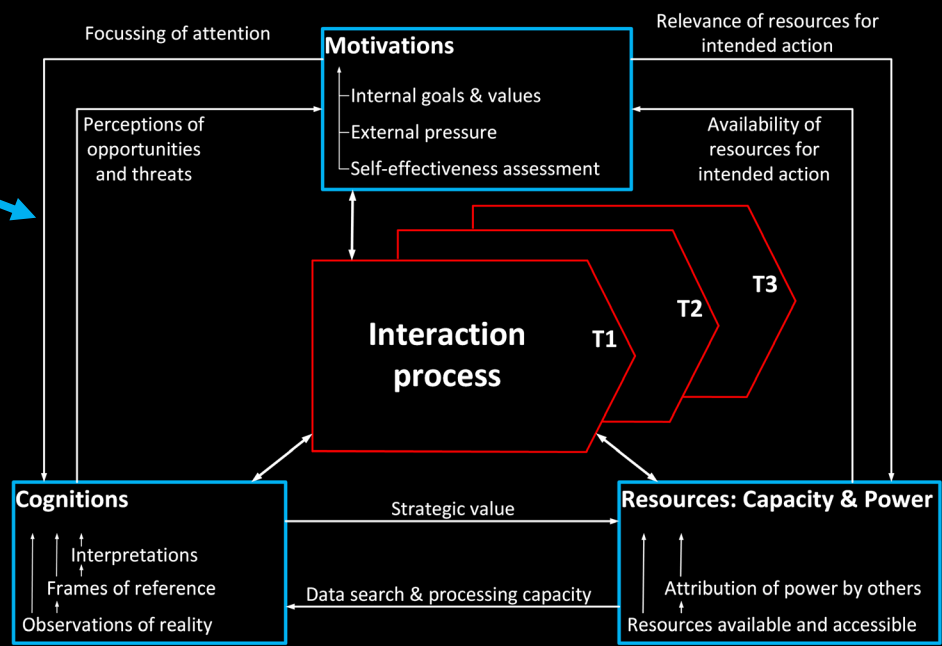
The research process



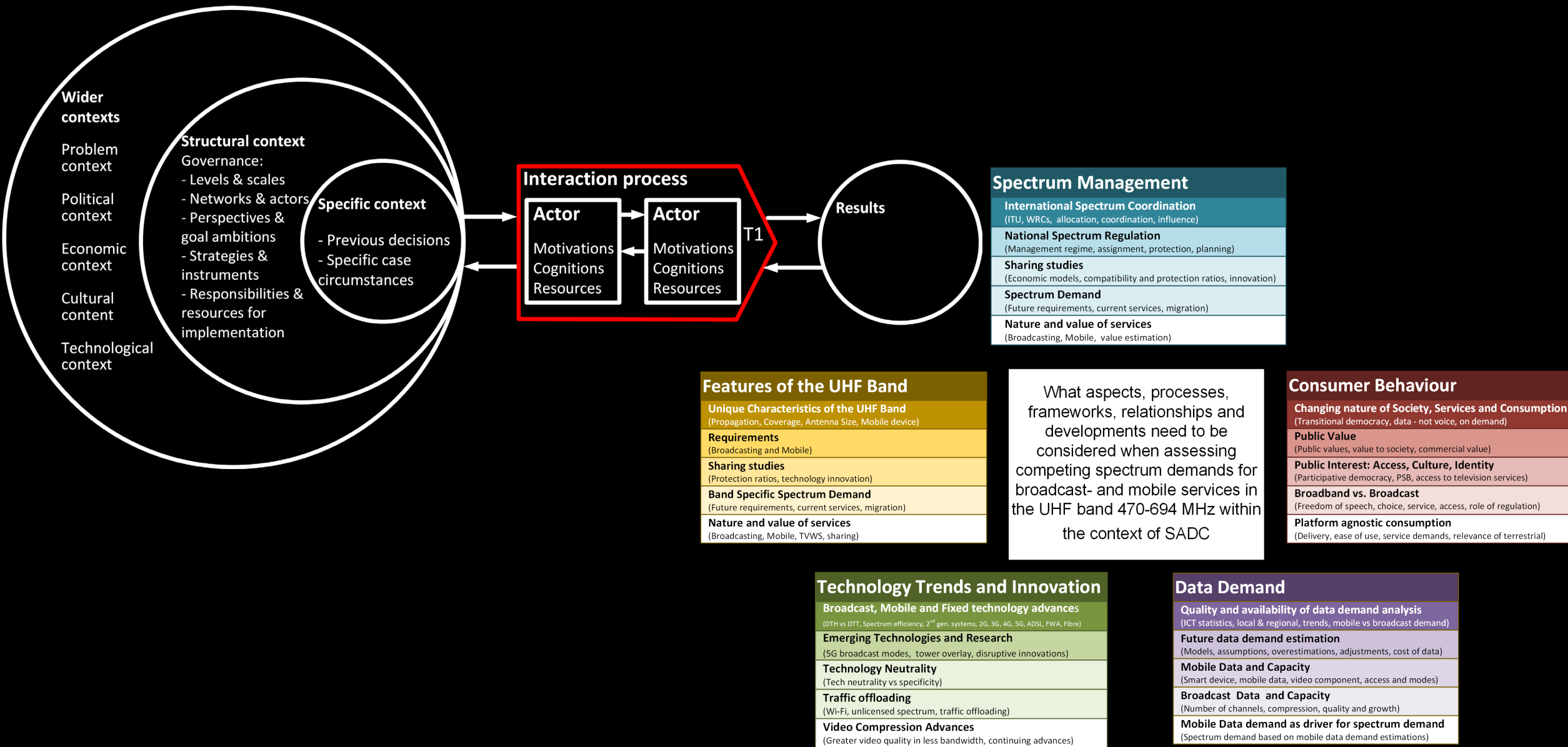
Contextual Interaction Theory (CIT) and the Dynamic Interaction Framework (DIF)



Dynamic Interaction Framework (DIF)



Contextual Interaction Theory (CIT)



Mapping to Contextual Interaction Theory (CIT)

What aspects, processes, frameworks, relationships and developments need to be considered when assessing competing spectrum demands for broadcast- and mobile services in the UHF band 470-694 MHz within the context of SADC

Spectrum Management

International Spectrum Coordination
(ITU, WRCs, allocation, coordination, influence)

National Spectrum Regulation
(Management regime, assignment, protection, planning)

Sharing studies
(Economic models, compatibility and protection ratios, innovation)

Spectrum Demand
(Future requirements, current services, migration)

Nature and value of services
(Broadcasting, Mobile, value estimation)

Wider contexts

Problem context

Political context

Economic context

Cultural context

Technological context

Structural context

Governance:
- Levels & scales
- Networks & actors
- Perspectives & goal ambitions
- Strategies & instruments
- Responsibilities & resources for implementation

Specific context

- Previous decisions
- Specific case circumstances

Interaction process

Actor

Motivations
Cognitions
Resources

Actor

Motivations
Cognitions
Resources

Results

Consumer Behaviour

Changing nature of Society, Services and Consumption
(Transitional democracy, data - not voice, on demand)

Public Value
(Public values, value to society, commercial value)

Public Interest: Access, Culture, Identity
(Participative democracy, PSB, access to television services)

Broadband vs. Broadcast
(Freedom of speech, choice, service, access, role of regulation)

Platform agnostic consumption
(Delivery, ease of use, service demands, relevance of terrestrial)

Technology Trends and Innovation

Broadcast, Mobile and Fixed technology advances
(DTH vs DTT, Spectrum efficiency, 2nd gen. systems, 2G, 3G, 4G, 5G, ADSL, FWA, Fibre)

Emerging Technologies and Research
(5G broadcast modes, tower overlay, disruptive innovations)

Technology Neutrality
(Tech neutrality vs specificity)

Traffic offloading
(Wi-Fi, unlicensed spectrum, traffic offloading)

Video Compression Advances
(Greater video quality in less bandwidth, continuing advances)

Features of the UHF Band

Unique Characteristics of the UHF Band
(Propagation, Coverage, Antenna Size, Mobile device)

Requirements
(Broadcasting and Mobile)

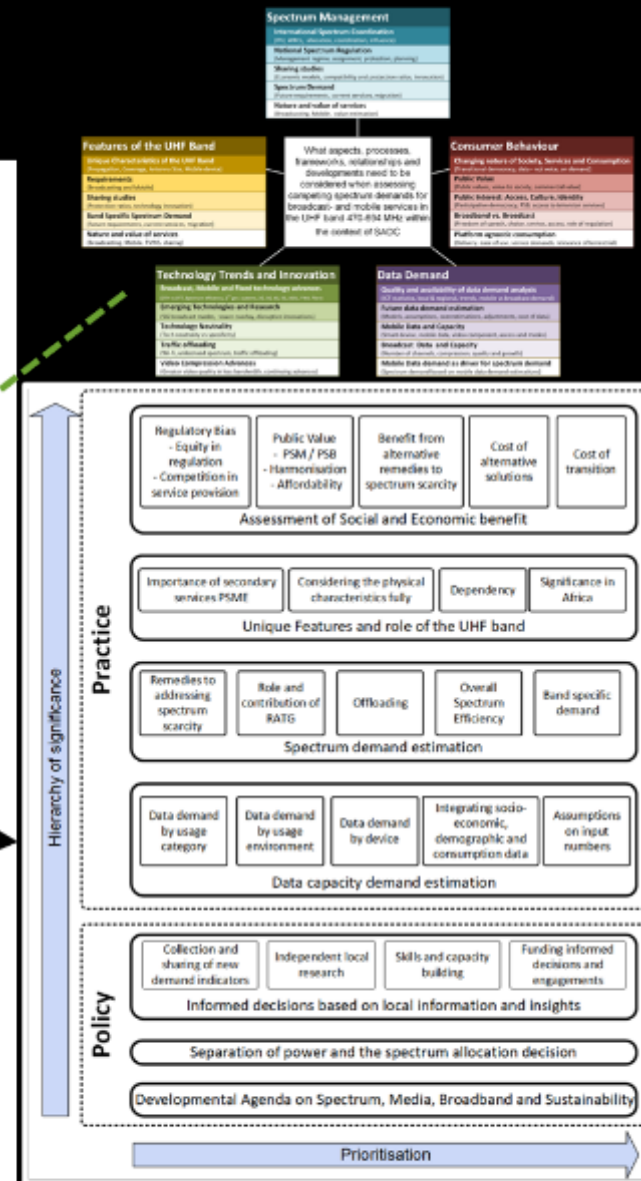
Sharing studies
(Protection ratios, technology innovation)

Band Specific Spectrum Demand
(Future requirements, current services, migration)

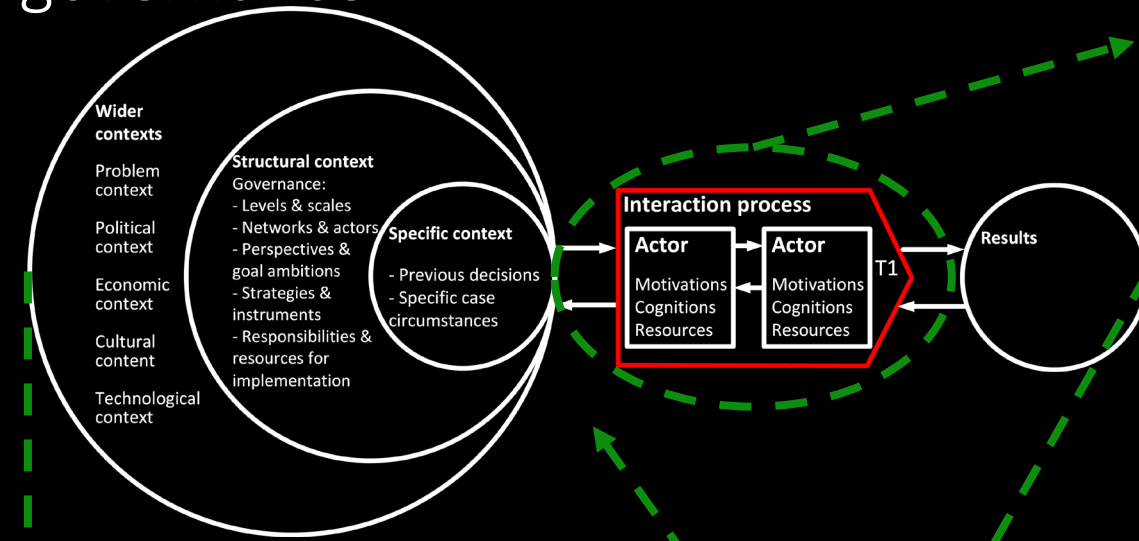
Nature and value of services
(Broadcasting, Mobile, TVWS, sharing)

Analysis and moving towards
A Contextual Capture Theory of
International Spectrum Governance

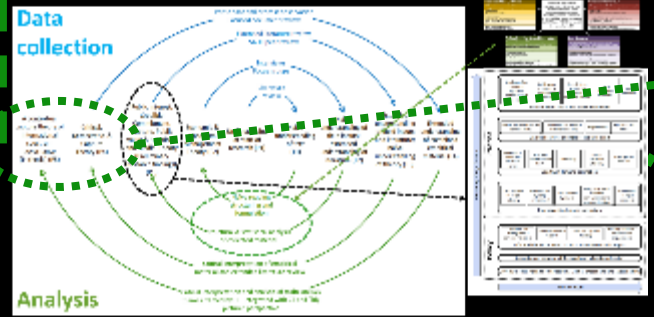
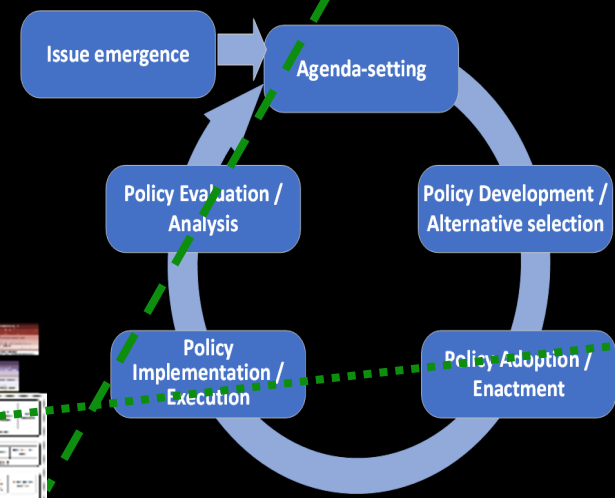
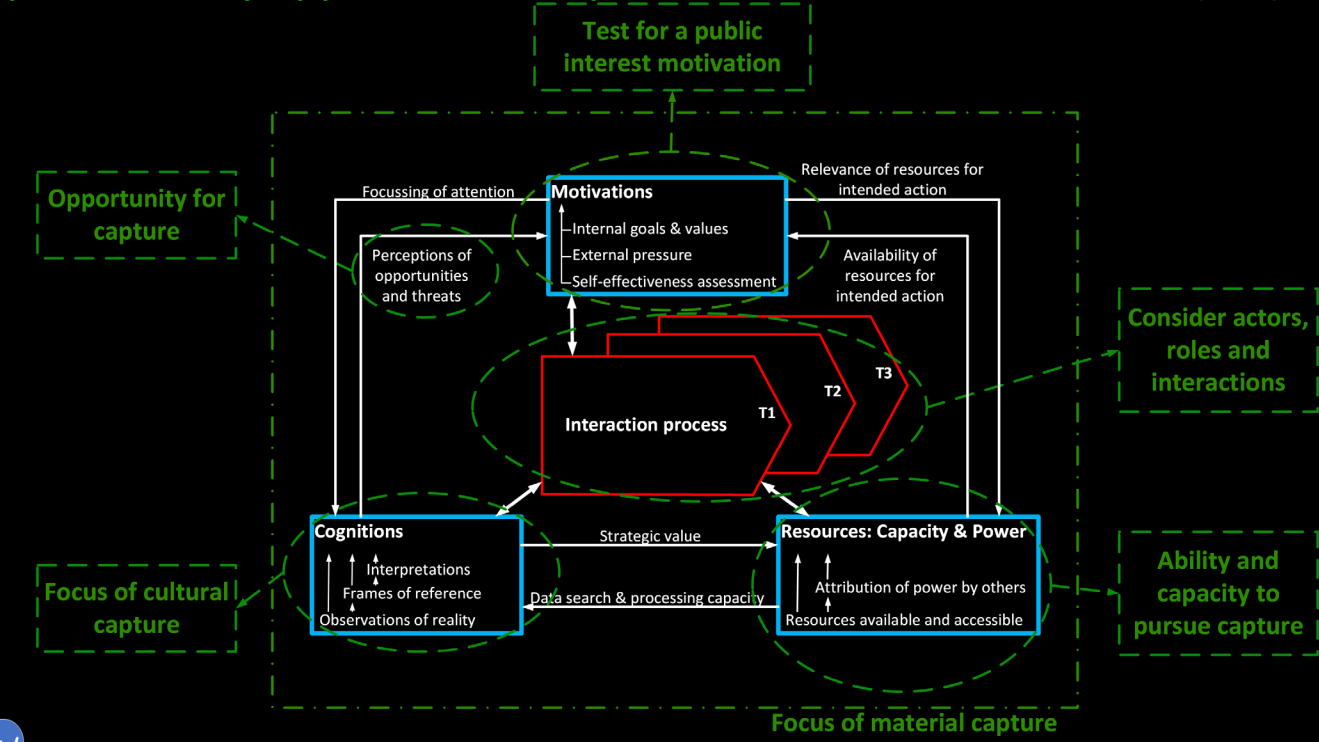
Data collection



Analysis and moving towards A contextual capture theory of international spectrum governance



Capture Theory applied to the Dynamic Interaction Framework (DIF)



Capture Theory (prospective)

- Identify capture risks
- Consider opportunities for capture
- Assess capacity and ability to pursue capture
- Identify potential captors and targeted processes and actors
- Consider mitigation measures to reduce capture risk

Data Chapters

Wider contexts

Spectrum demand estimation informed by:

- Economic conditions
- Political conditions
- Policy and regulatory frameworks
- Freedoms, rights and values of citizens, consumers and constituents
- Service purviews
- Technology advances and alternatives
- Regional interdependence

Structural context

Governance of the spectrum allocation decision

- The SADC perspective

Spectrum allocation as policy decision

- Who sets the Agenda?
- Roles and responsibilities in preparing for the WRC
- Who signs off on the spectrum allocation decision?
- Domesticating the spectrum allocation decision
- Levels and scales in the WRC study-cycle
- Influence and influencers

Specific context

- Scientific method for demand estimation
- Band specific demand
- Overstating the propagation benefits
- Sharing and coexistence

Interactions and results of WRC-23

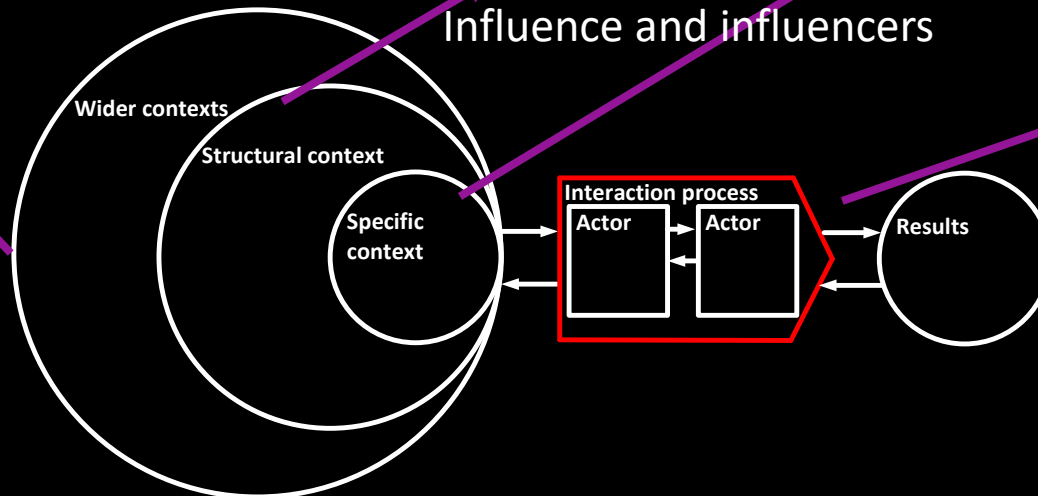
WRC-23 decision on the UHF band
The process and interactions on AI1.5 throughout the WRC-23 study-cycle

- Study Group, working party, NPWG, SADC, ATU
- Task Group 6/1
- CPM text and CPM23-2
- WRC-23

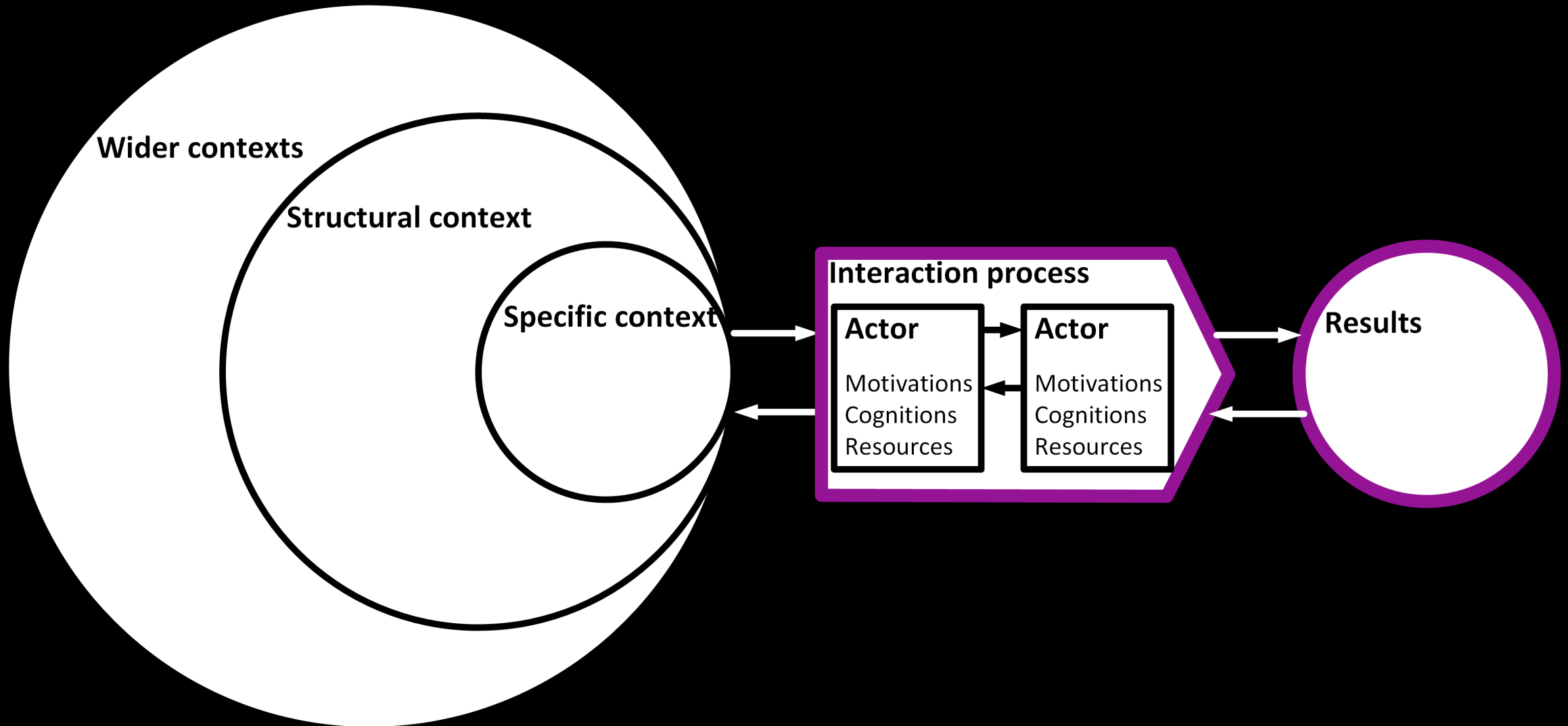
Band specific demand

Overstating the propagation benefits

Sharing and coexistence



Interactions and Results



Interactions and results

Deadline for study inputs from

WPs to TG6/1

(15 May 2021)

Deadline for CPM text

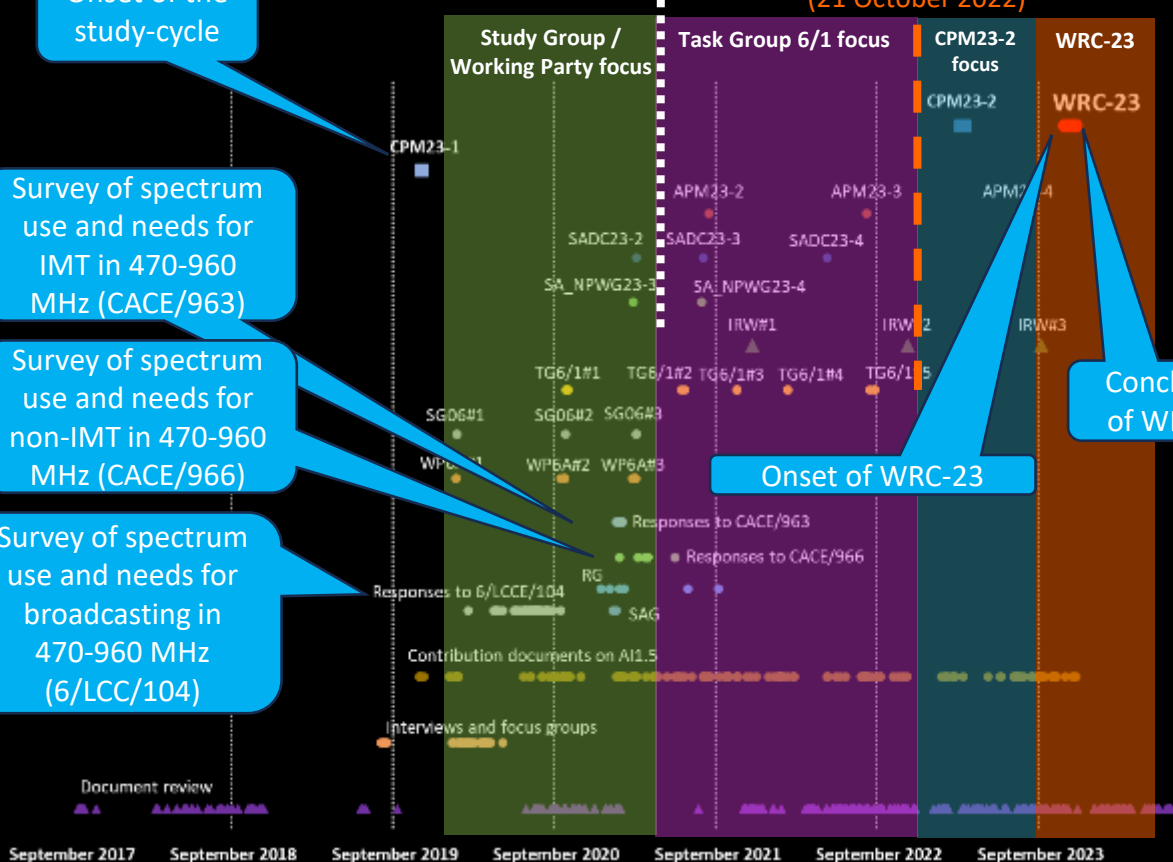
(21 October 2022)

Onset of the study-cycle

Survey of spectrum use and needs for IMT in 470-960 MHz (CACE/963)

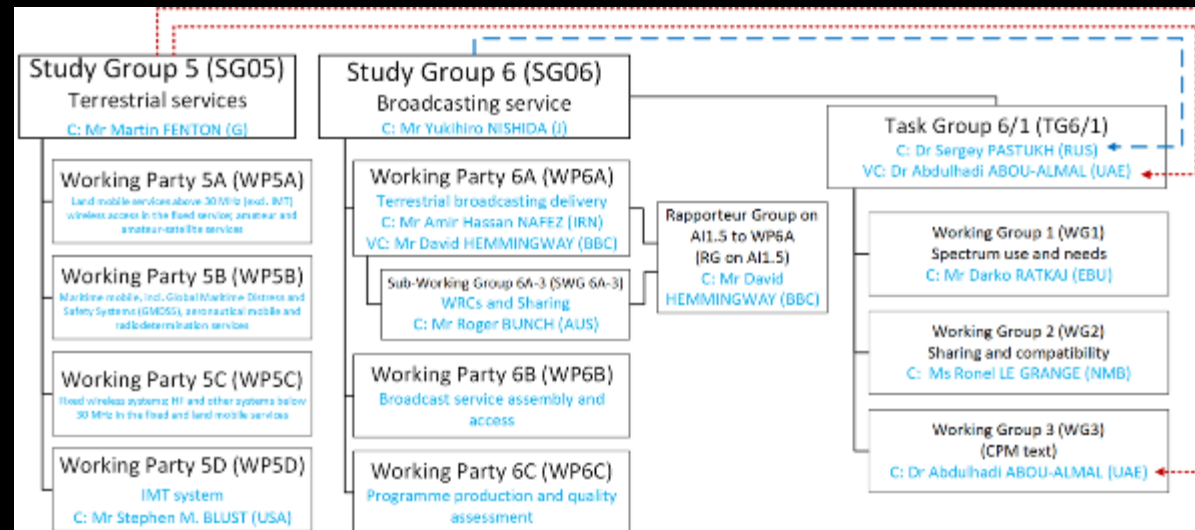
Survey of spectrum use and needs for non-IMT in 470-960 MHz (CACE/966)

Survey of spectrum use and needs for broadcasting in 470-960 MHz (6/LCC/104)



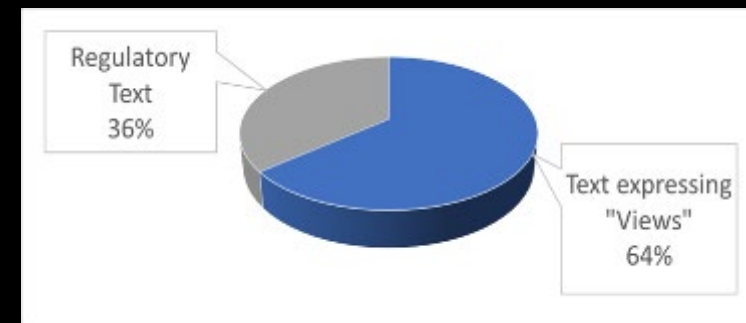
Onset of WRC-23

Conclusion of WRC-23



- Limited constructive progress and disillusionment (BT.2301-2 and BT.2302)
- TG6/1 structure framed at CPM23-1
 - VC and Chair of WG on CPM text
 - Instance on "Views"
 - Three administrations preventing 60 others from progress
 - Poor CPM text

CPM text on AI1.5

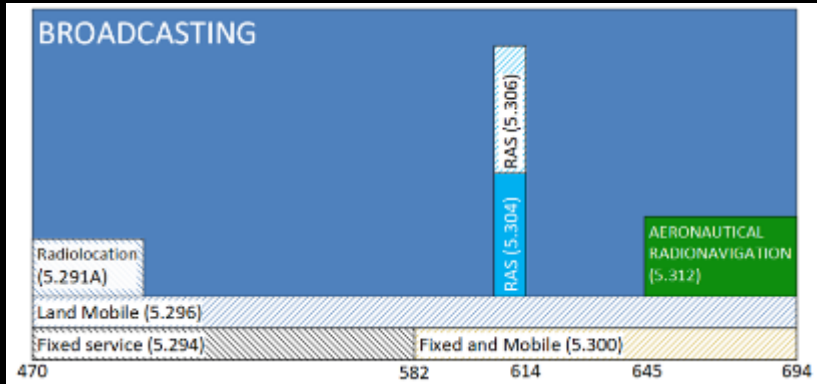


- SADC looking Northwards
 - Encouraged to participate in ITU-R studies
 - Studies not productive
- Varying levels of participation in surveys (6/LCC/104, CACE/963, CACE/966, CRASA)
- Contributors to SADC and ATU meetings
 - GSMA, GSA
 - EBU, BNE

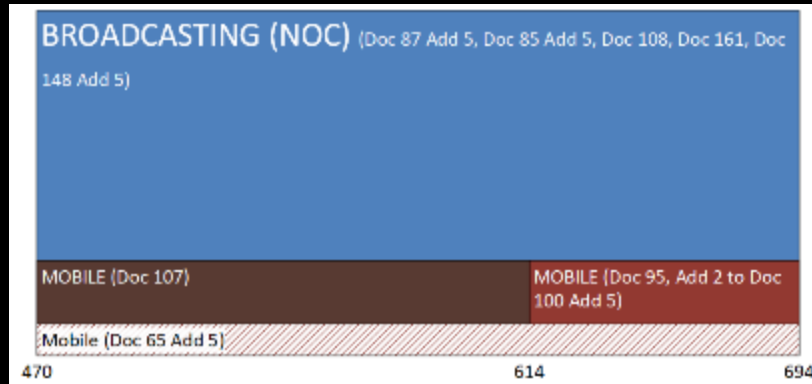


Interactions and results: WRC-23 results on AI1.5

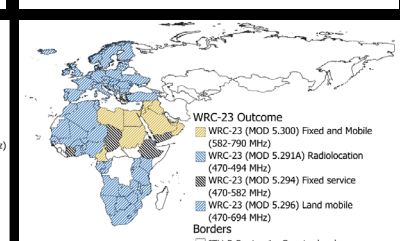
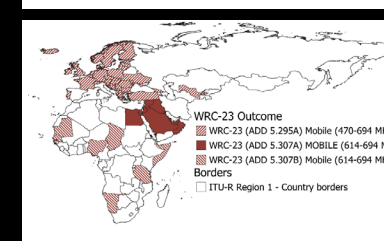
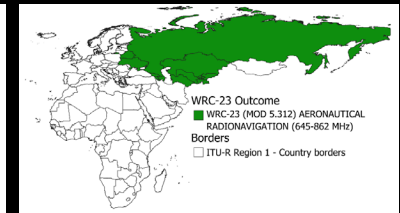
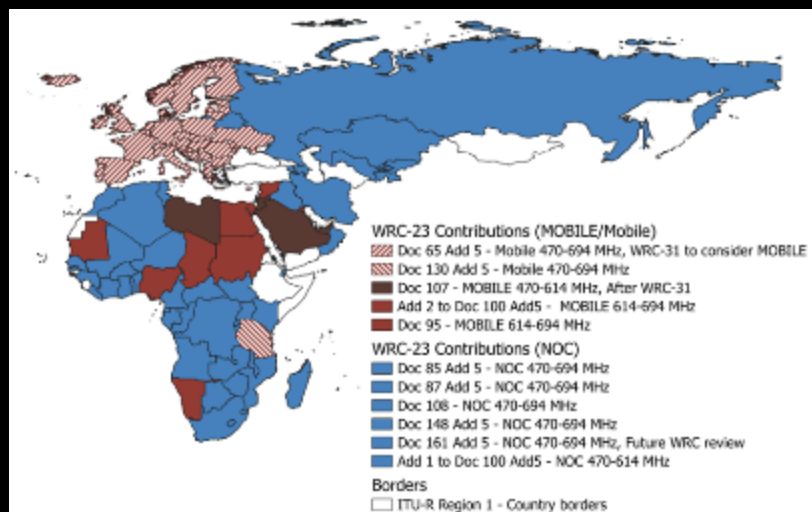
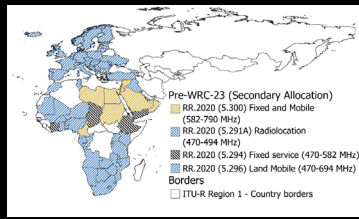
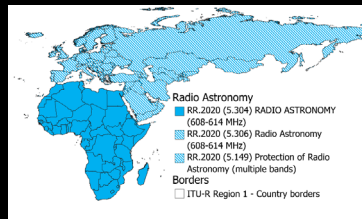
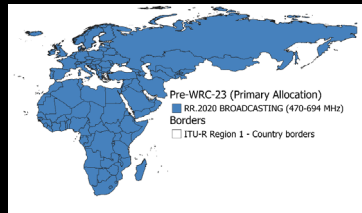
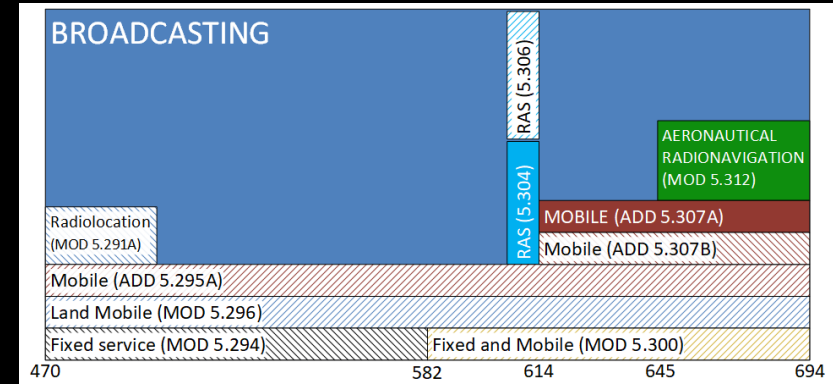
Before (2019)
(onset of WRC-23 study-cycle)



Contributions to WRC-23

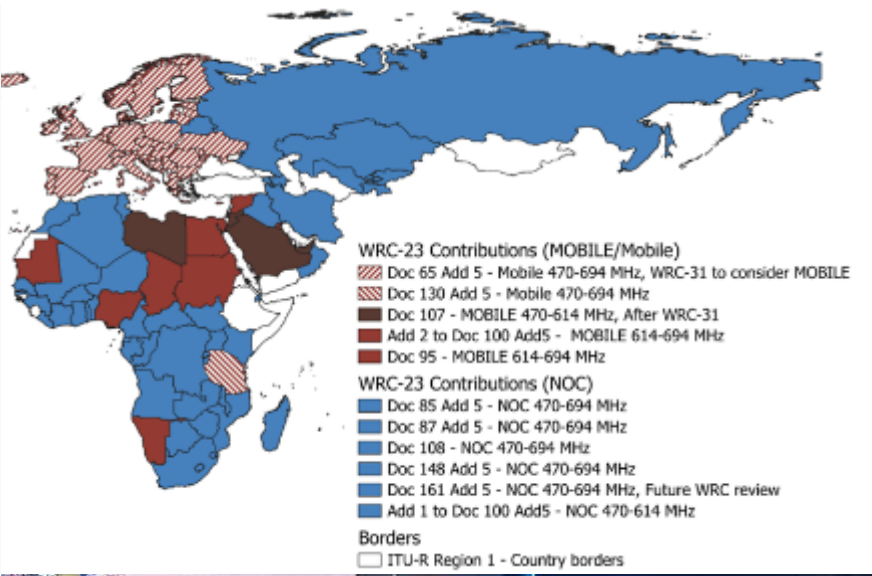


After
(post WRC-23)

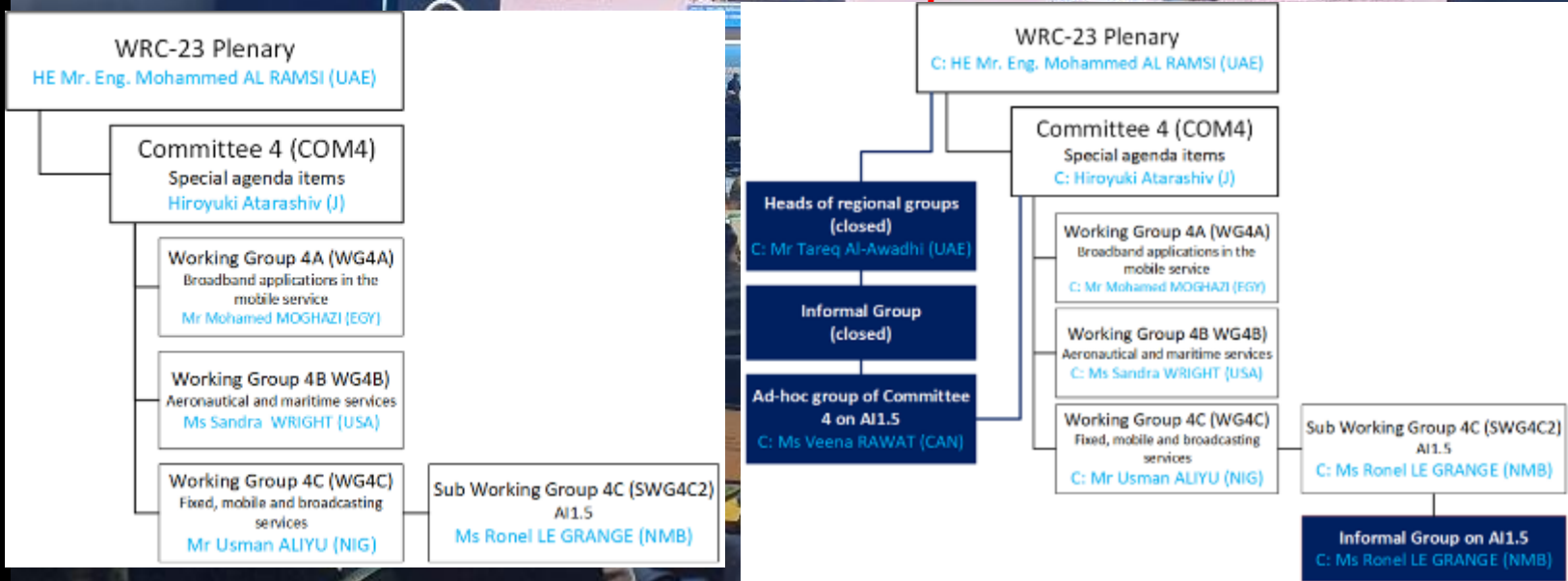


Interactions and results: WRC-23

Contributor(s)	Contribution Document: Position (Method, Alternative)	470-614 MHz	614-694 MHz	IMT identification	Count of Countries	Countries
RCC	Doc 85 Add 5: NOC 470-694 MHz (A,A1)	NOC		NA	8	AZE, ARM, BLR, KAZ, KGZ, RUS, TJK, UZB
ATU (AfCP)	Doc 87 Add 5: NOC 470-694 MHz (A,A1)	NOC		NA	40	ALG, AGL, BEN, BOT, BFA, BDI, CPV, CME, CAF, COM, COG, CTI, DJI, CO D, SWZ, GNE, GAB, GMB, GHA, GUI, KEN, LSO, LBR, MDG, MWI, MLI, MAU, MRC, MOZ, NGR, RRW, STP, SEN, AFS, SSD, TGO, TUN, UGA, ZMB, ZWE
ALG, DJI, IRQ, MRC, OMA, TUN	Doc 108: NOC 470-694 MHz (A, A1)	NOC		NA	6	ALG, DJI, IRQ, MRC, OMA, TUN
IRN	Doc 148 Add 5: NOC 470-694 MHz (A, A1)	NOC		NA	1	IRN
AFS	Doc 161 Add 5: NOC 470-694 MHz, Future WRC review (A, A2)	NOC		NA	1	AFS
ARB(ADD 1)	Add 1 to Doc 100 Add5: NOC 470-614 MHz (A, A1)	NOC		NA	11	ALG, BHR, DJI, EGY, IRQ, KWT, MTN, MRC, OMA, SYR, TUN
ARB(ADD 2)	Add 2 to Doc 100 Add5; MOBILE 614-694 MHz (B, B1)		MOBILE	IMT	12	BHR, COM, EGY, JOR, KWT, LBY, MTN, PSE, ARS, SDN, SYR, UAE
EGY, NMB, NIG, TCD	Doc 95: MOBILE 614-694 MHz (C, C1)		MOBILE	IMT	4	TCD, EGY, NMB, NIG
ARS, UAE, PSE, JOR, LBY	Doc 107: MOBILE 470-614 MHz, After WRC-31	MOBILE		NO	5	ARS, UAE, PSE, JOR, LBY
CEPT (ECP)	Doc 65 Add 5: Mobile 470-694 MHz, WRC-31 to consider MOBILE (F, F2)		Mobile	NO	40	AUT, BEL, BIH, BUL, CYP, CZE, D, DNK, E, EST, F, FIN, G, GRC, HNG, HOL, HRV, I, IRL, ISL, LIE, LTU, LUX, LVA, MCO, MDA, MKD, MLT, MNE, NOR, POL, POR, ROU, S, SMR, SRB, SUI, SVK, SVN, UKR
TZA	Doc 130 Add 5: Mobile 470-694 MHz (F, F2)		Mobile	NO	1	TZA



We have seen an expanding role for the regional heads (...) they do not have the authority to make decisions on behalf of all Member States. The regional heads are not the highest level of the conference, the Plenary of Member States is, and must continue to be, the highest level (ITU-R, 2023au 01:24:54)



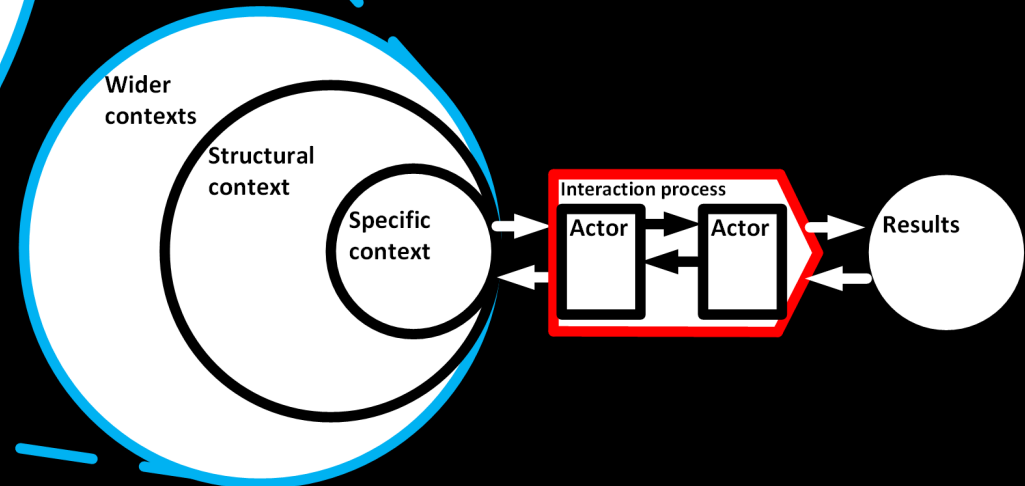
- The WRC-23 study-cycle on AI1.5 seems severely flawed and influenced by pro-mobile stakeholders that were able to
- frustrate studies
 - serve as gatekeeper for drafting the key output texts (CPM text)
 - exert influence through pro-mobile office-bearers and
 - ultimately chair the final deliberations outside the view of the general conference

Analysis: Wider context

Wider contexts

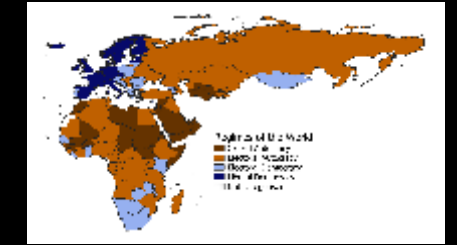
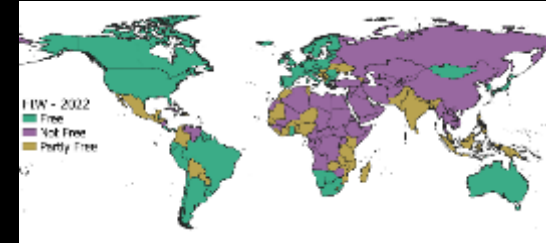
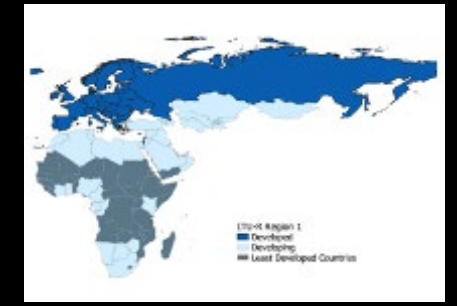
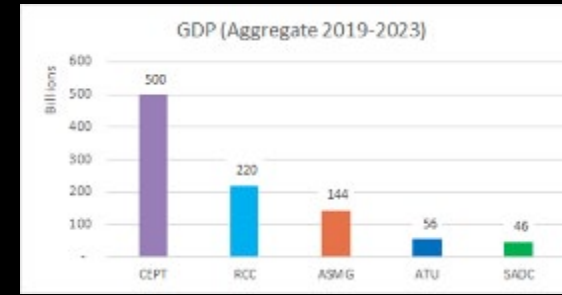
Spectrum demand estimation informed by:

- Economic conditions
- Political conditions
- Policy and regulatory frameworks
- Freedoms, rights and values of citizens, consumers and constituents
- Service purviews
- Technology advances and alternatives
- Regional interdependence

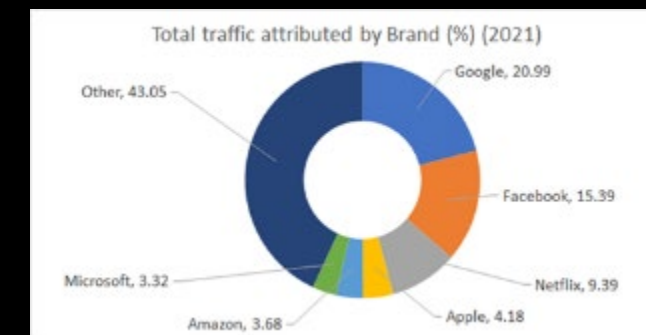
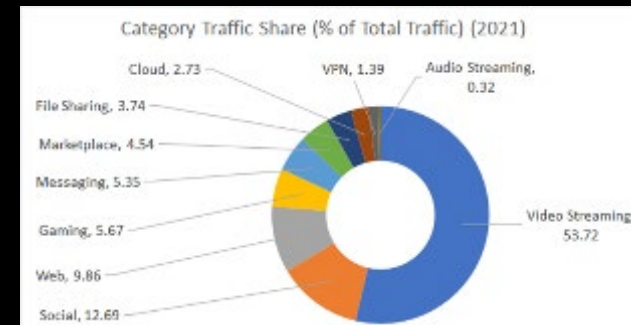
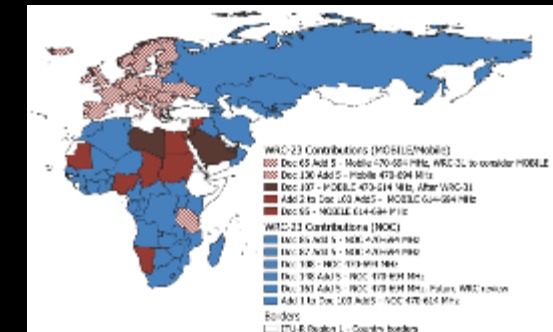


Analysis: the wider context

- Large economic power disparities
- Diverse political rights and civil liberties apply
- Diverse political, legislative and regulatory regimes (by nation-state, spectrum and service)
- Diverse socio-cultural identities
- Organised global mobile industry and uncoordinated national broadcast services
- Highly diverse use and needs for UHF spectrum
- SADC and ATU as technology users
- Technological advances / regressions
- Global data trends: Video (53%), Four brands = 50% of global data volume



Country	Independent Broadcast Regulator	Independent Spectrum Regulator	Public Service Broadcaster (PSB)	Single regulator (broadcast, spectrum, telecommunications)
Botswana	N	N	N	Y
Comoros		N	N	
Democratic Republic of Congo	N	N	N	N
eSwazini	N	N	N	Y
Lesotho	N	N	N	Y
Madagascar	N	N	N	N
Malawi	N	N	N	Y
Mauritius	N	N	N	N
Mozambique	N		N	N
Namibia	N	N	N	Y
Seychelles	Y (for media content regulator)	N	N	N
	N (for licensing)			
South Africa	Y	Partial	PSB not vulnerable	Y
Tanzania and Zanzibar	N	N	N	Y
Zambia	N	N	N	N
Zimbabwe	N	N	N	N



Analysis: Structural Context

Structural context

Governance of the WRC study-cycle

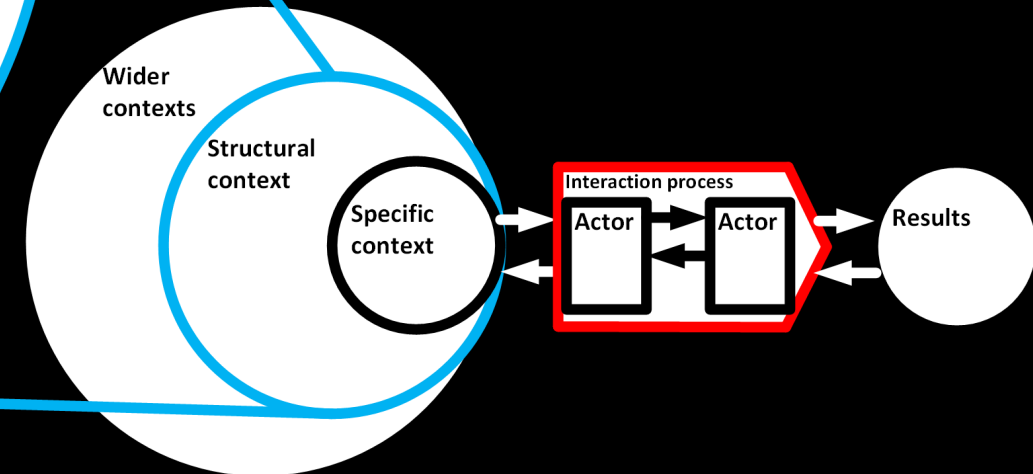
- The SADC perspective

Spectrum allocation as policy decision

- Who sets the Agenda?
- Roles and responsibilities in preparing for the WRC
- Who signs off on the spectrum allocation decision?
- Domesticating the spectrum allocation decision

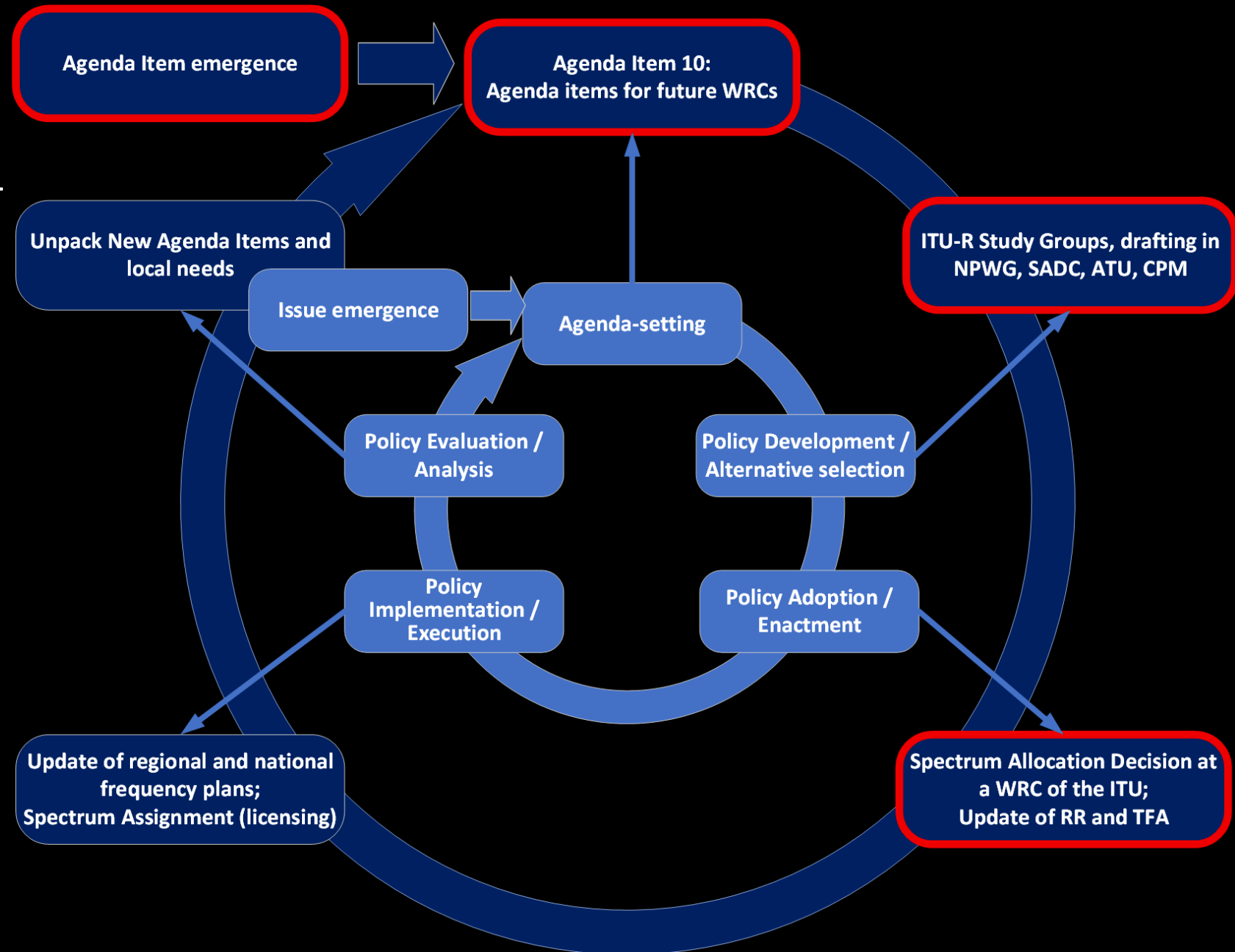
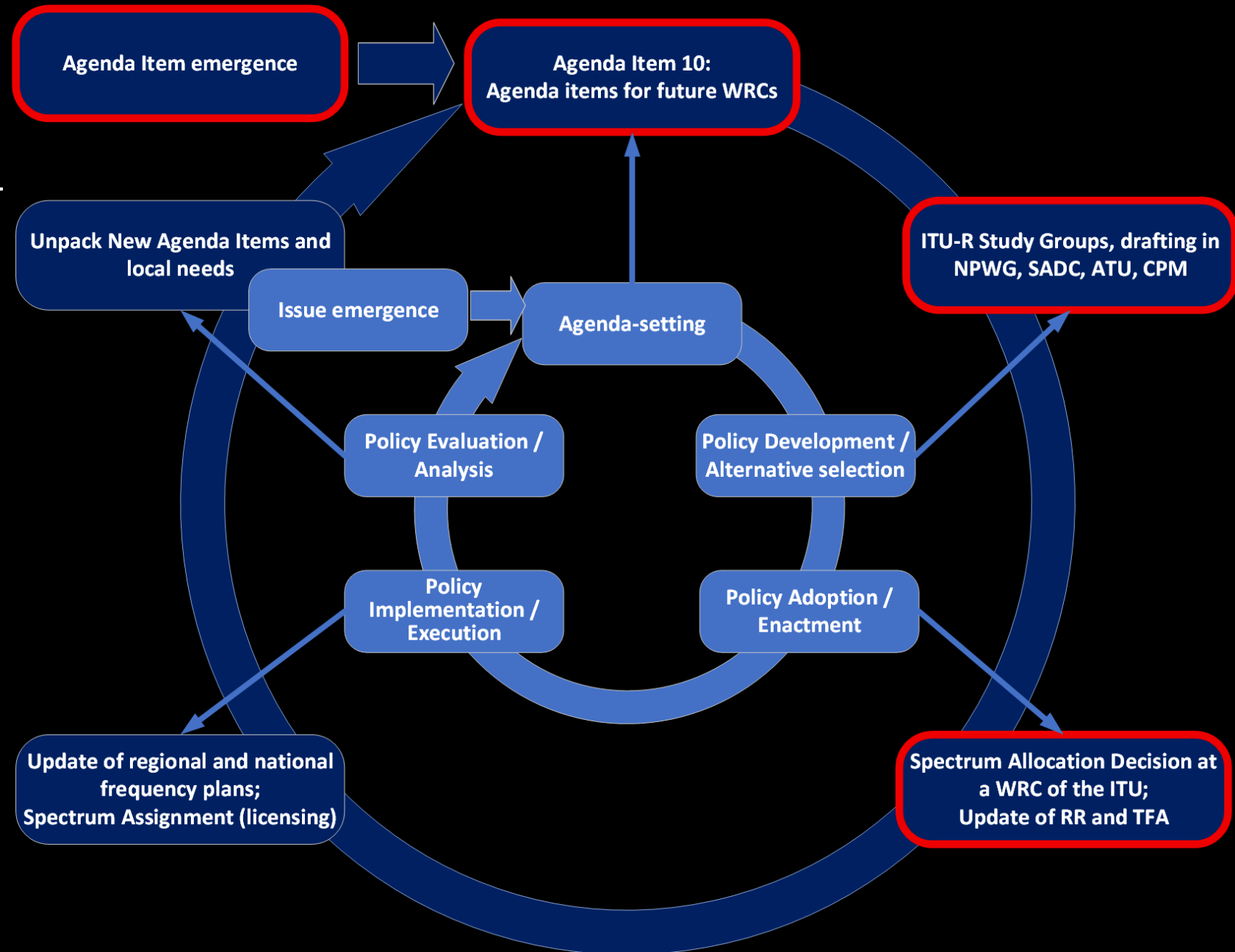
Levels and scales in the WRC study-cycle

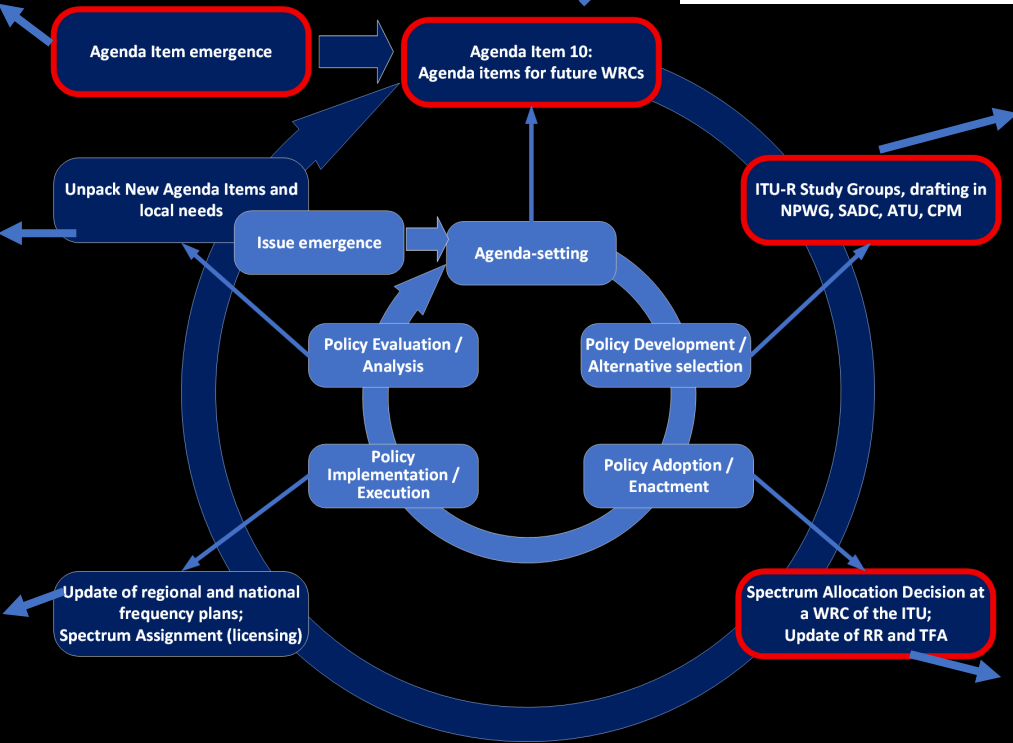
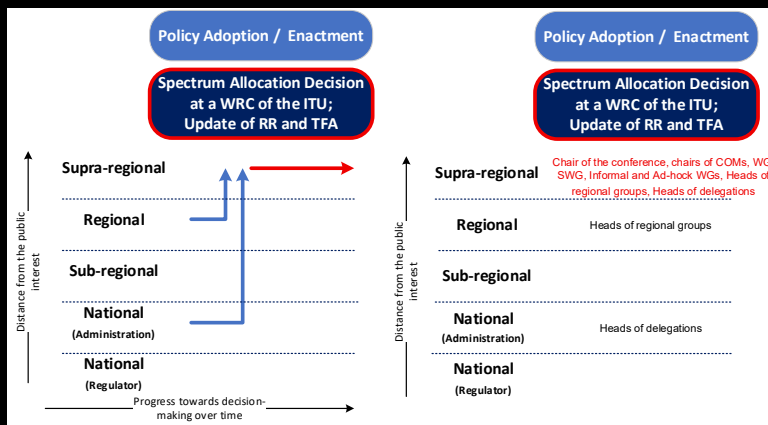
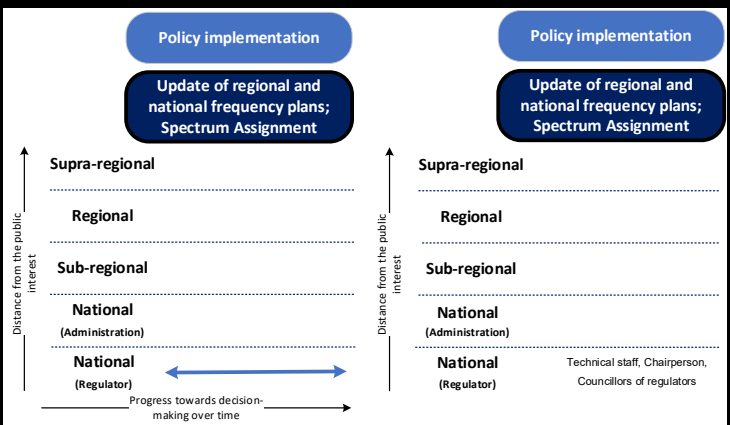
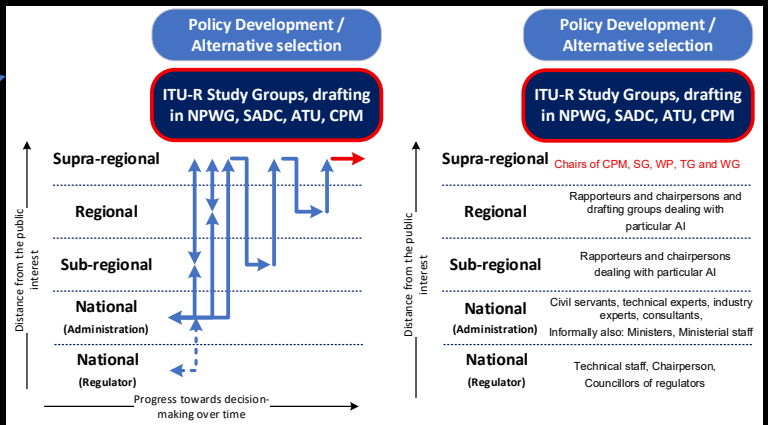
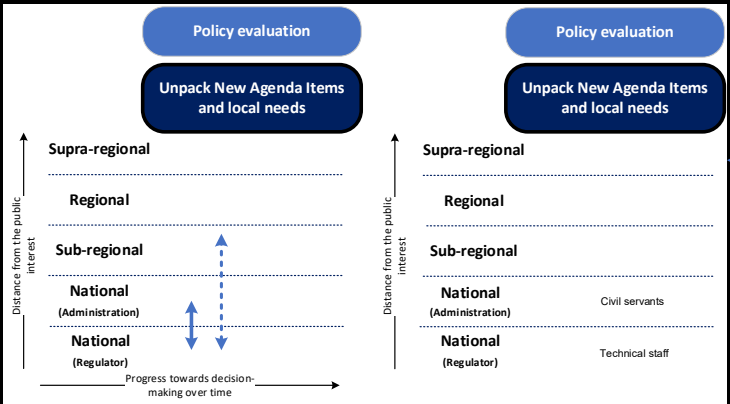
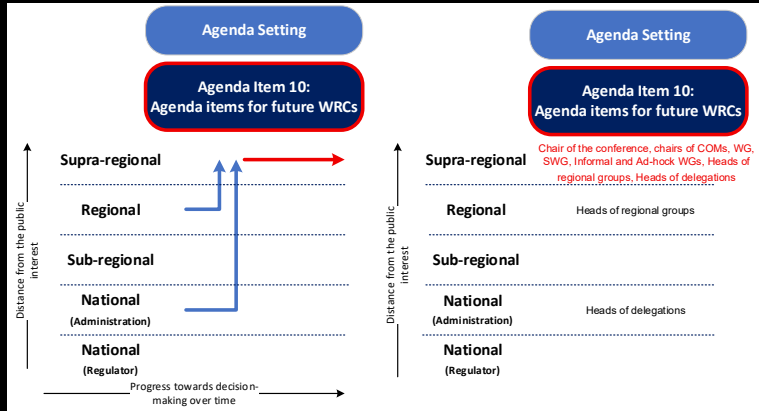
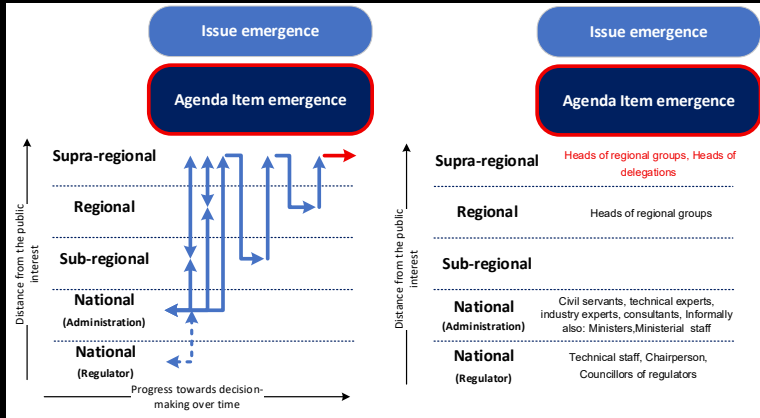
Influence and influencers



Analysis: Structural context

- Considering the policy process and the WRC-study-cycle
- Analyse the levels and flows by process element
- Consider decision-making level
- National or multi-national
- Consider framing provisions
- Identify potential captors and targeted processes and actors
- Consider process flows and actors

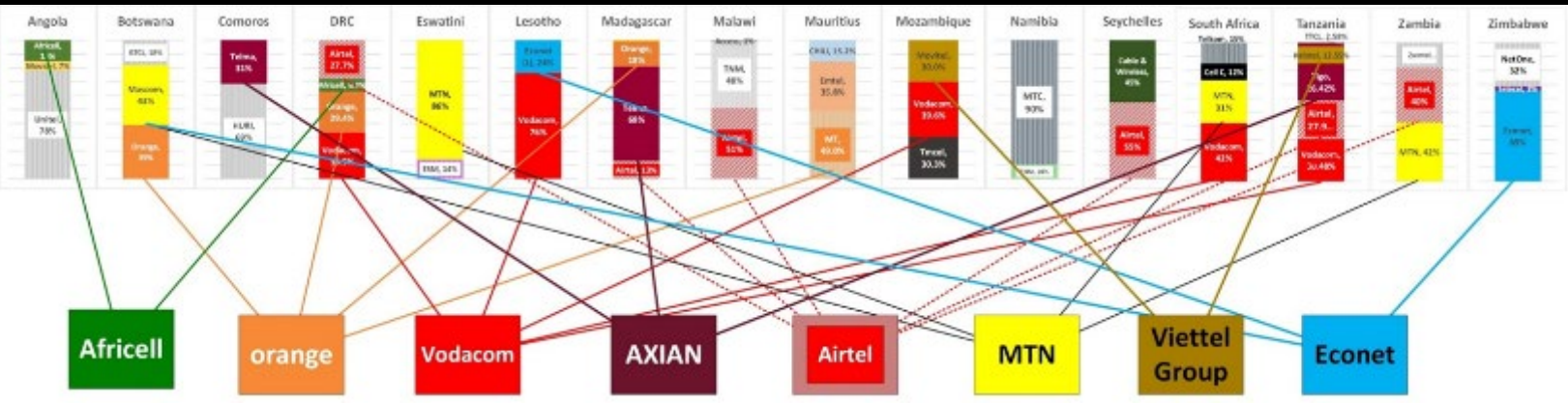




Analysis: Structural context – process, actors, targets and actors

- Decision makers differ by level and policy element
 - Ministers, administrators, officials in regulatory agencies, and officials in centralised spectrum groups
- Mobile industry
 - Multinational influence
 - Government shareholding
- Broadcasters
 - Predominantly “state” broadcasters (SADC)
 - National
- Administrators key actors towards the SAD
 - Spectrum regulation not independent (SADC)
 - Country position and representation at WRC

Presence of multinational MNOs across the SADC



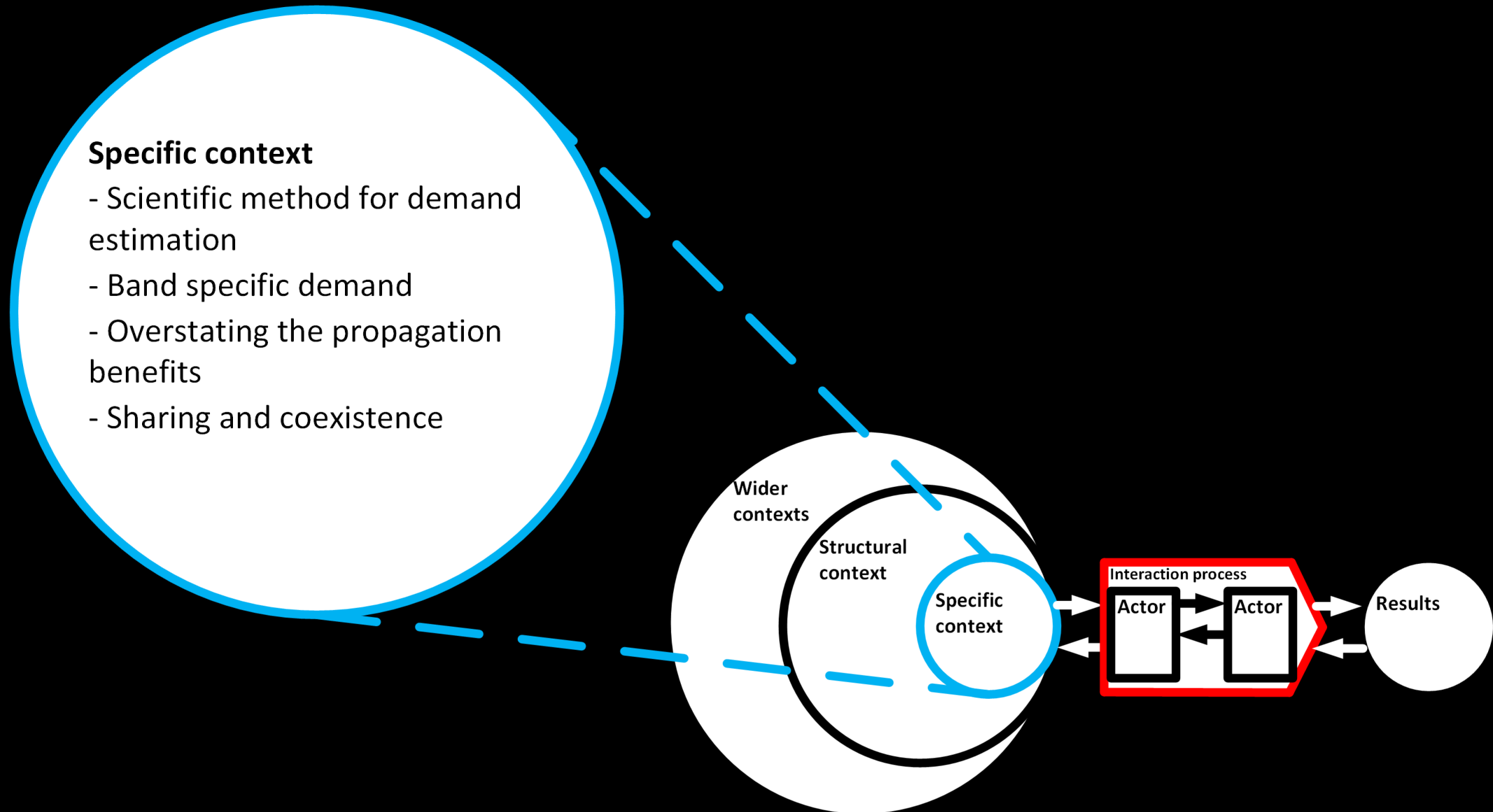
Countries with Government shareholding in one or more MNO



Broadcast regulation and prevalence of “state” broadcasters

Country	Independent Broadcast Regulator	Independent Spectrum Regulator	Public Service Broadcaster (PSB)	Single regulator (broadcast, spectrum telecommunications)
Botswana	N	N	N	Y
Comoros	N	N	N	N
Democratic Republic of Congo	N	N	N	N
eSwatini	N	N	N	Y
Lesotho	N	N	N	Y
Madagascar	N	N	N	N
Malawi	N	N	N	Y
Mauritius	N	N	N	N
Mozambique	N	N	N	N
Namibia	N	N	N	Y
Seychelles	Y (for media content regulation) N (for licensing)	N	N	N
South Africa	Y	Partial	PSB but vulnerable	Y
Tanzania and Zanzibar	N	N	N	Y
Zambia	N	N	N	N
Zimbabwe	N	N	N	N

Analysis: Specific context of the UHF band

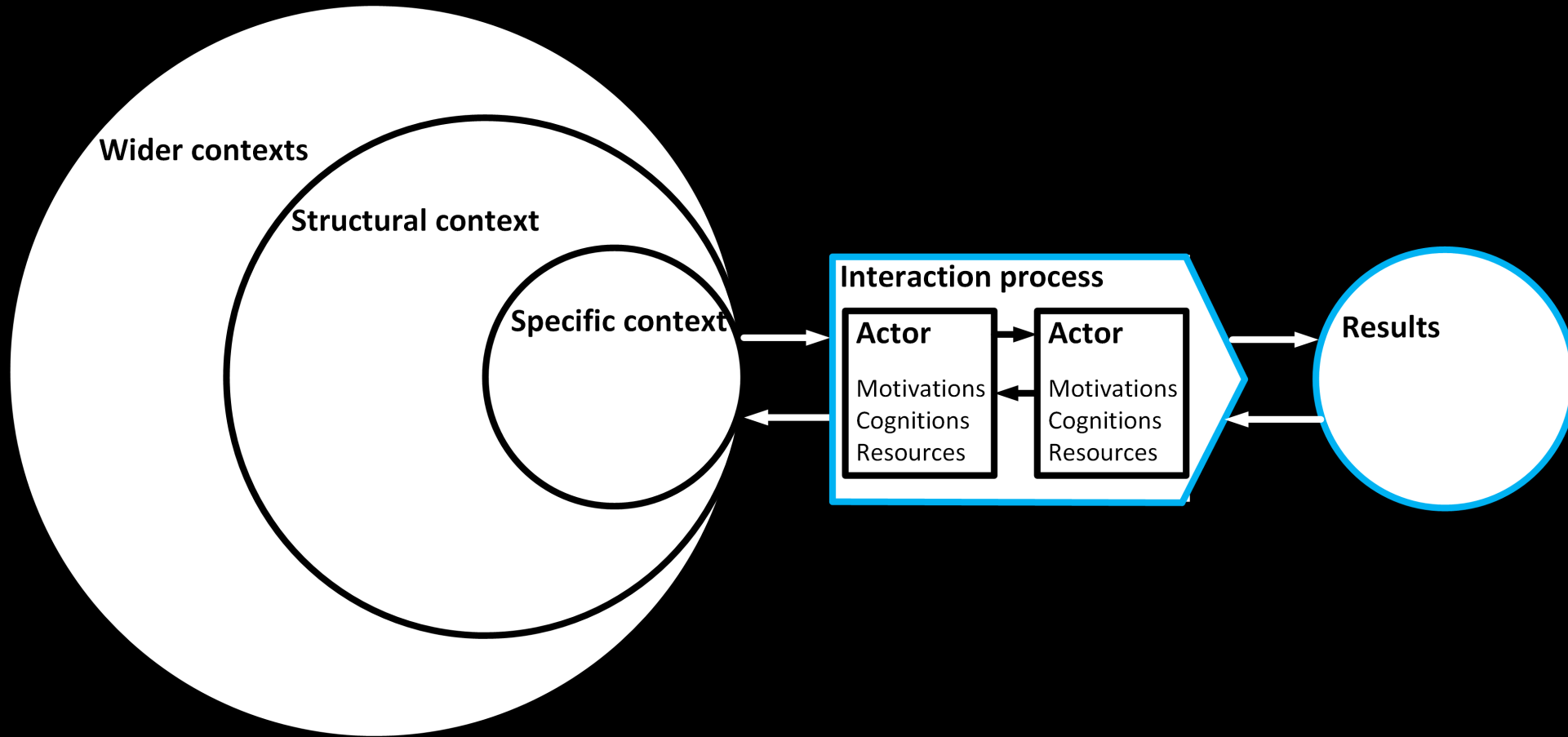


Analysis: Specific context of the UHF band

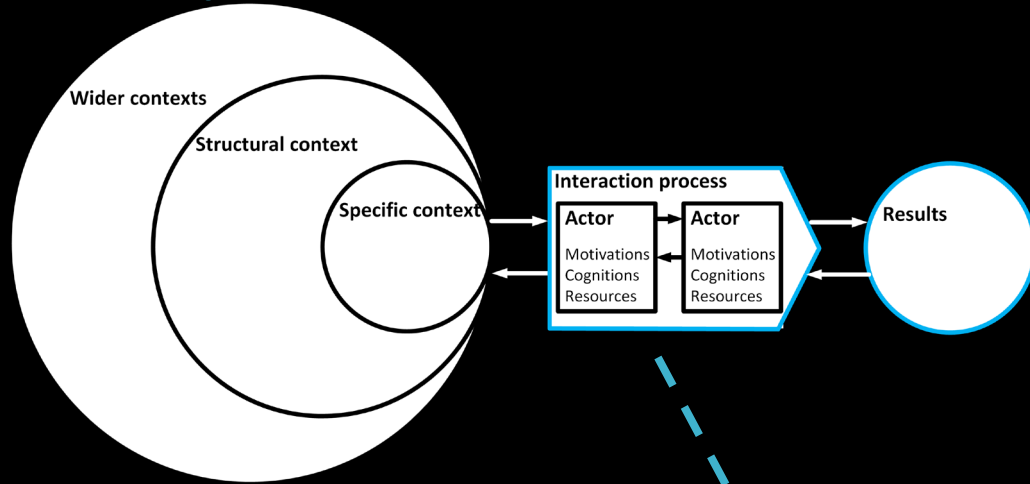
- Formal studies of spectrum use and needs in WRC-23 study-cycle were unproductive
 - Substance ignored and procedurally sabotaged
- Mobile industry studies
 - Flawed and biased approach
 - Impact of favourable propagation characteristics
 - Apply equally to broadcast and mobile
 - Overstated benefits for mobile and misrepresentation of savings
 - Studies of socio-economic benefit of allocation to mobile
 - Disembedded from public value and public interest
 - Falsification of public interest
- Sharing and coexistence is not a mystery
 - Appendix L

Low-band spectrum is the cornerstone of digital equality and a driver of broad and affordable connectivity. It is a crucial national asset that can build bridges towards digital inclusion and ensure the impact of mobile's economic and social benefits are felt in all communities (GSMA, 2022e, p. 4).

Analysis: Interactions and results of WRC-23

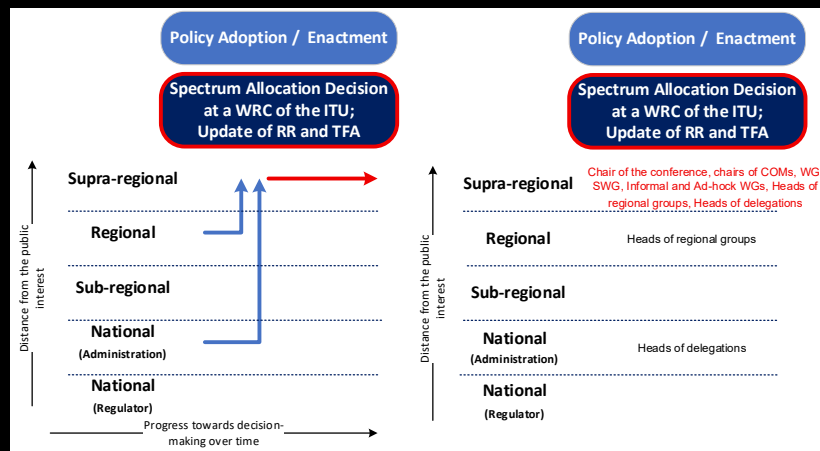
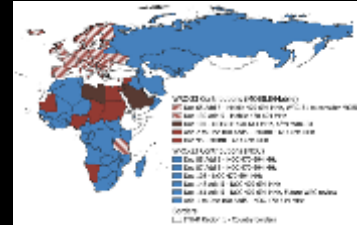


Analysis of Interactions focussed on final WRC-23

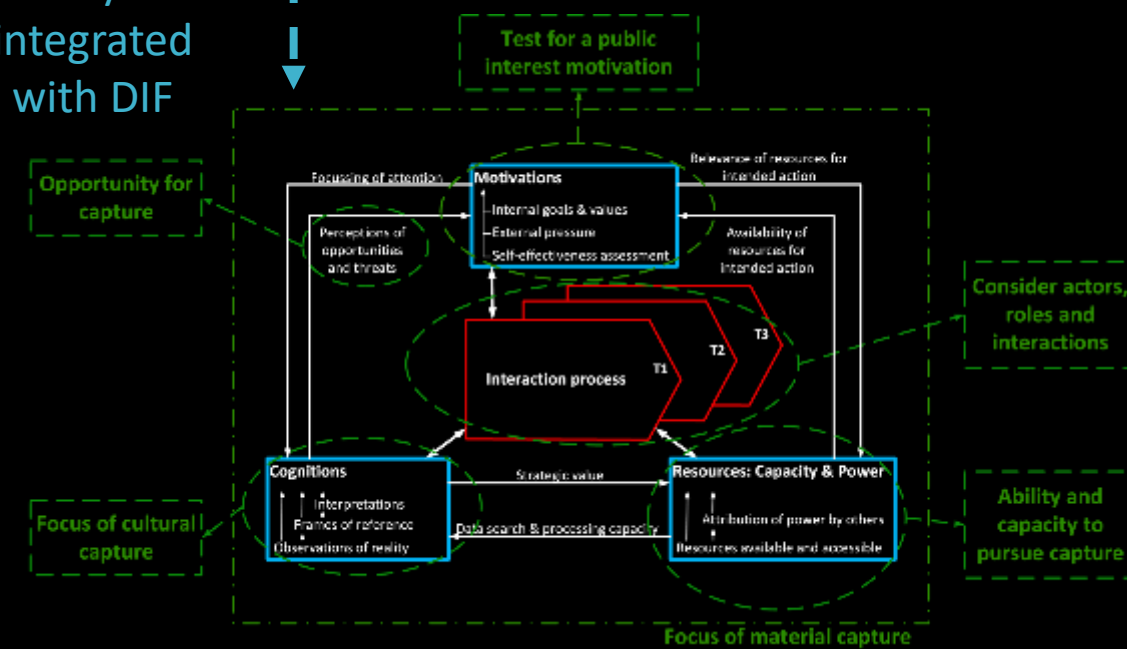
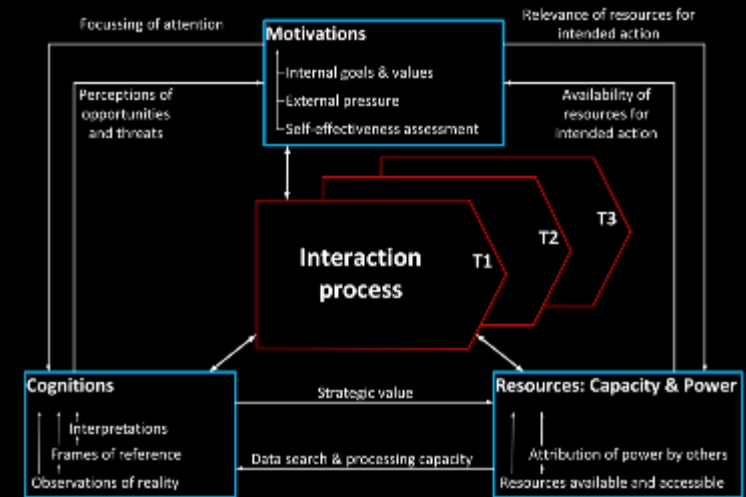


Twofold application of the DIF

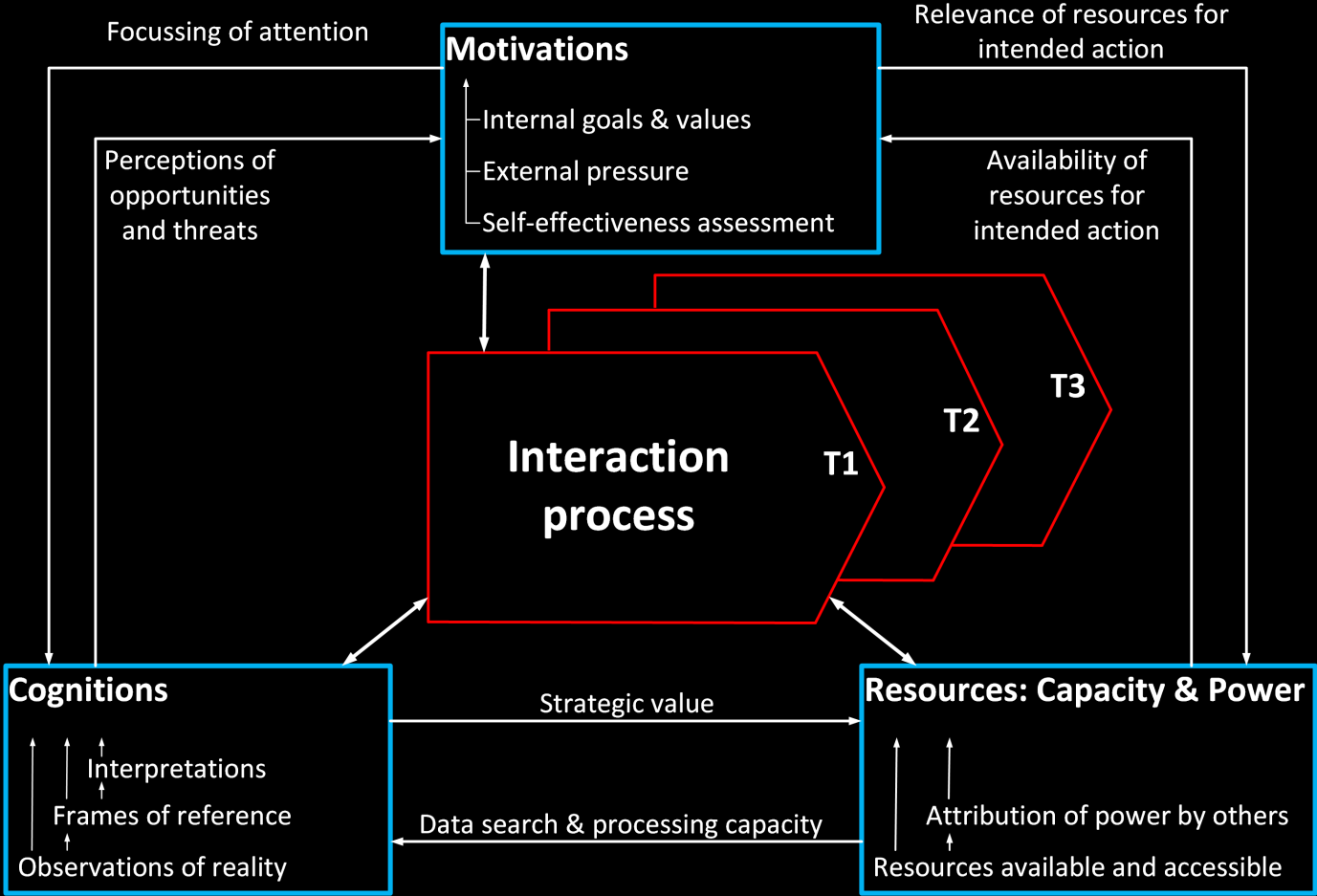
1. Generic grouping
2. Specific contribution



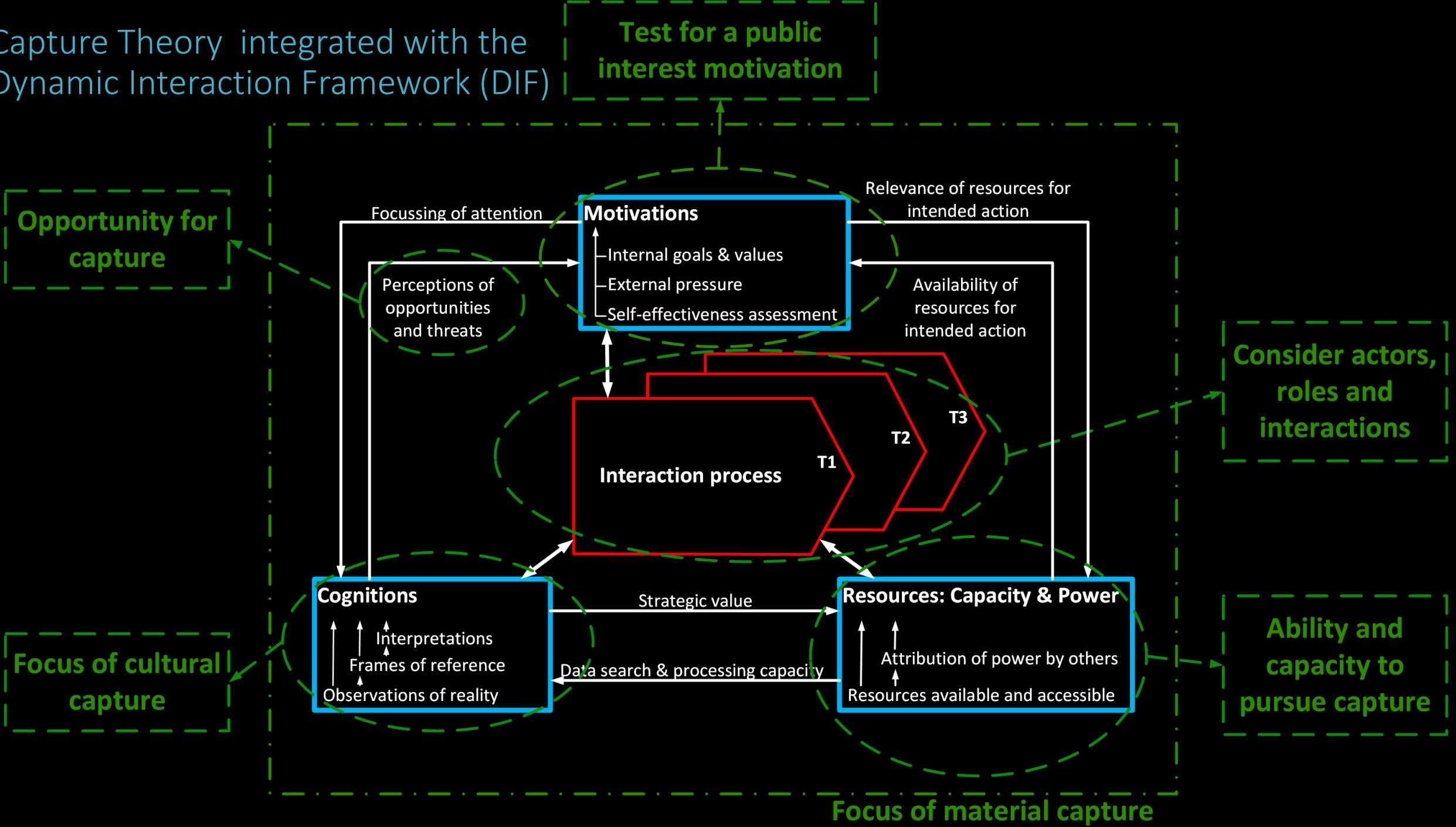
Capture risk analysis integrated with DIF



Dynamic Interaction Framework (DIF)



Capture Theory integrated with the Dynamic Interaction Framework (DIF)



Analysis: Material capture and information problems

Predominant influences	Observations
Sabotage	The creation of the gate-keeper role of the vice-chair in TG6/1 with the link role of WG chair for drafting CPM text in AI1.5 serves as example of political capture of the work of TG6/1. It was possible for the person appointed in the role could sabotage the process, impact prevent meaningful broadcaster input and undermine the epistemic value of the CPM text prepared (See Figure 7-9 and 7.3.3). Attempts at capture by sabotage were also made at SG6
Information reliance	Industry studies are heavily relied upon (INT-013) with some stakeholders conscious that there would be an underlying bias (INT-021); and others acknowledging that some data presented is one-sided and biased (INT-014); See 25.16.2.
Excessive information	The number of meetings, studies and submission on WRC agenda items is overwhelming for capacity restrained regulators (see 25.16.2 and 25.16.6). Stakeholders inevitably referring to GSMA studies and “quoting them a lot because they do a lot of studies” (INT-021) and these are freely shared and referenced during lobbying.
Establishing pre-eminence in decision making spheres	Mobile industry is well resourced and able to participate in all meetings becoming the dominant voice in all proceedings (discussed in detail in 5.3; 25.16.6; 5.3.4; 5.3).
Representational influence	The preeminent role the GSMA, GSA and mobile industry play in presenting at preparatory meetings, doing studies and disseminating these at each opportunity (see 5.3.4) and directly to the Ministers, chairs and senior executives of regulators and administrations (see 25.5.8). The pattern of engagement observed in SG6 and TG6/1 and at conference where meeting time is captured applies (see. Figure 7-8 and Table 7-2)
Misinformation	Regulators and administrations entertaining the demand for more spectrum regardless of evidence that suggest sufficient supply given the socio-economic conditions and gap between allocated and assigned spectrum (Thukani, 2017; Womersley, 2014, 2019). (See also 6.1.1, 8.4.1 and 25.8)

Analysis: Cultural capture and worldview problems

Predominant influences	Observations
Acceptance of a pro-mobile bias	Indicative of cultural capture is that the WRC-23 conference structure would propose obviously tainted and biased individuals as chairs for Committees and Working Groups towards the SAD at the conference and that no objections are made or alternatives proposed from the floor (see Figure 7-12 and 7.3.4).
Shared identity	Trend towards claiming a joint goal of universal service and access, skills development, training, sharing information on “best practice” creating the perception that the commercial objectives of the mobile industry serve the public interest; (ATU, 2020, 2021e, 2021b). The 2022 GSMA 5G spectrum positions highlight “the areas where governments, regulators, and the mobile industry must cooperate to make 5G a success” (GSMA, 2022a, p. 2).
Shared messaging	The experience of stakeholders virtually uniformly re-iterating the overstated propagation advantages and so-called lower network costs in the UHF band without actually analysing the facts or look into the detail comes to mind. See 8.4.3 and the detail in 25.5.9. Also, in apply the argument as if it had a bearing only on mobile is a further element illustrating one-sided endorsement of messages provided.
No alarm at obvious intent to influence and lacking transparency	Wide-spread attendance over 20 years of Ministerial Programme, an “invitation-only event, targeted at senior government and industry leaders” (GSMA, 2025a, p. 1) that “brings together ministries, regulatory bodies and the mobile sector to discuss the policies, challenges and emerging technologies shaping the digital economy and society” (GSMA, 2023a, p. 1).

Contribution to Theory

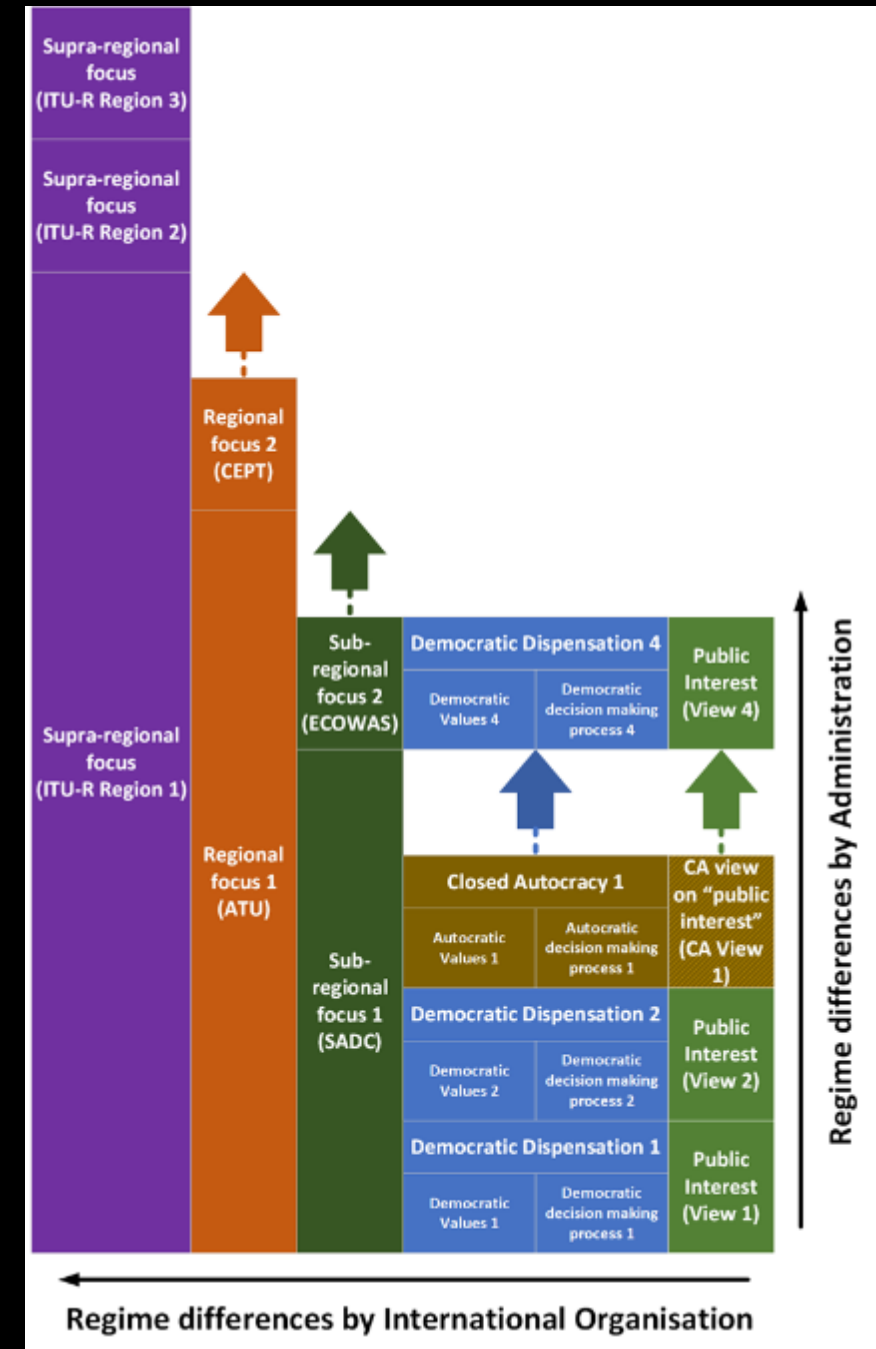
Gaps considered

Limits or weakness of capture theory

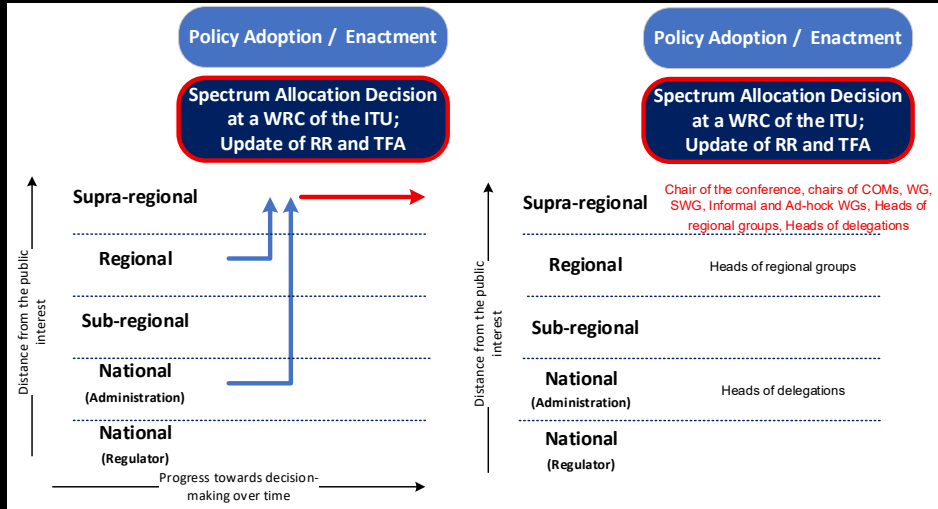
Domestic Perspective

Predominantly homogenous perspective on democracy, democratic principles and public interest

Theory assumes a predominantly stable legislative, administrative and regulatory environment with clear and sufficiently empowering provisions to pursue the public interest



The global public interest



Pursuit of a global public interest

- Varieties of democracy
- Different governance framing by IO and level
- Unpack the IO legitimisation

Legitimisation of international organisations (Steffek, 2015)

1. Preventing the abuse of power by powerful states, office bearers and interest groups by setting in place the prerequisite checks and balances
2. Ensuring a “high epistemic quality” (Steffek, 2015, p. 265) of decision-making informed by the best available information and considering what would best serve the public interest
3. Processes and decisions should be “respectful of human and civil rights” (Steffek, 2015, p. 265).

Possible capture risk mitigation strategies

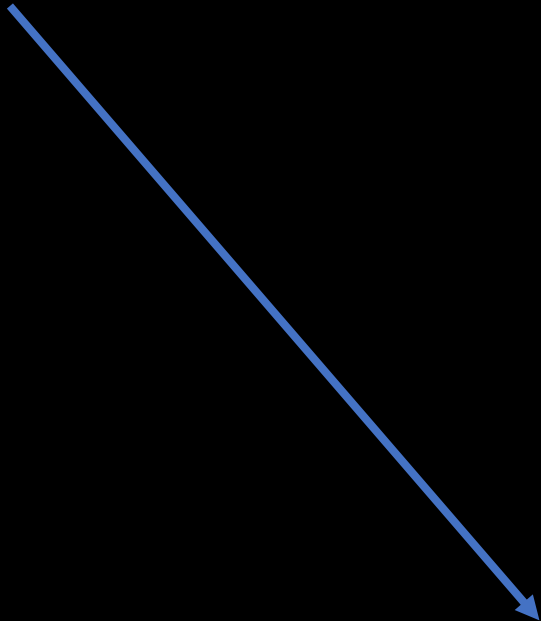
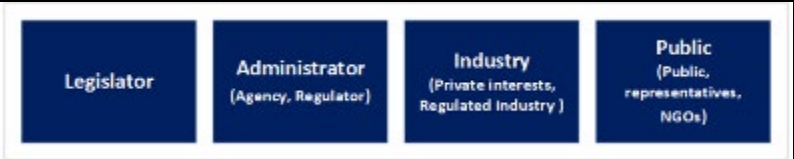
- Power balance (not achieved for WRC-23 AI1.5)
- Epistemic quality (questionable for WRC-23 AI1.5 decision)

CT in non-homogenous legislative and administrative environments

- Differences highlight possible governance gaps and capture risks
- Consider these by level

Expanding on the capture levels and targets

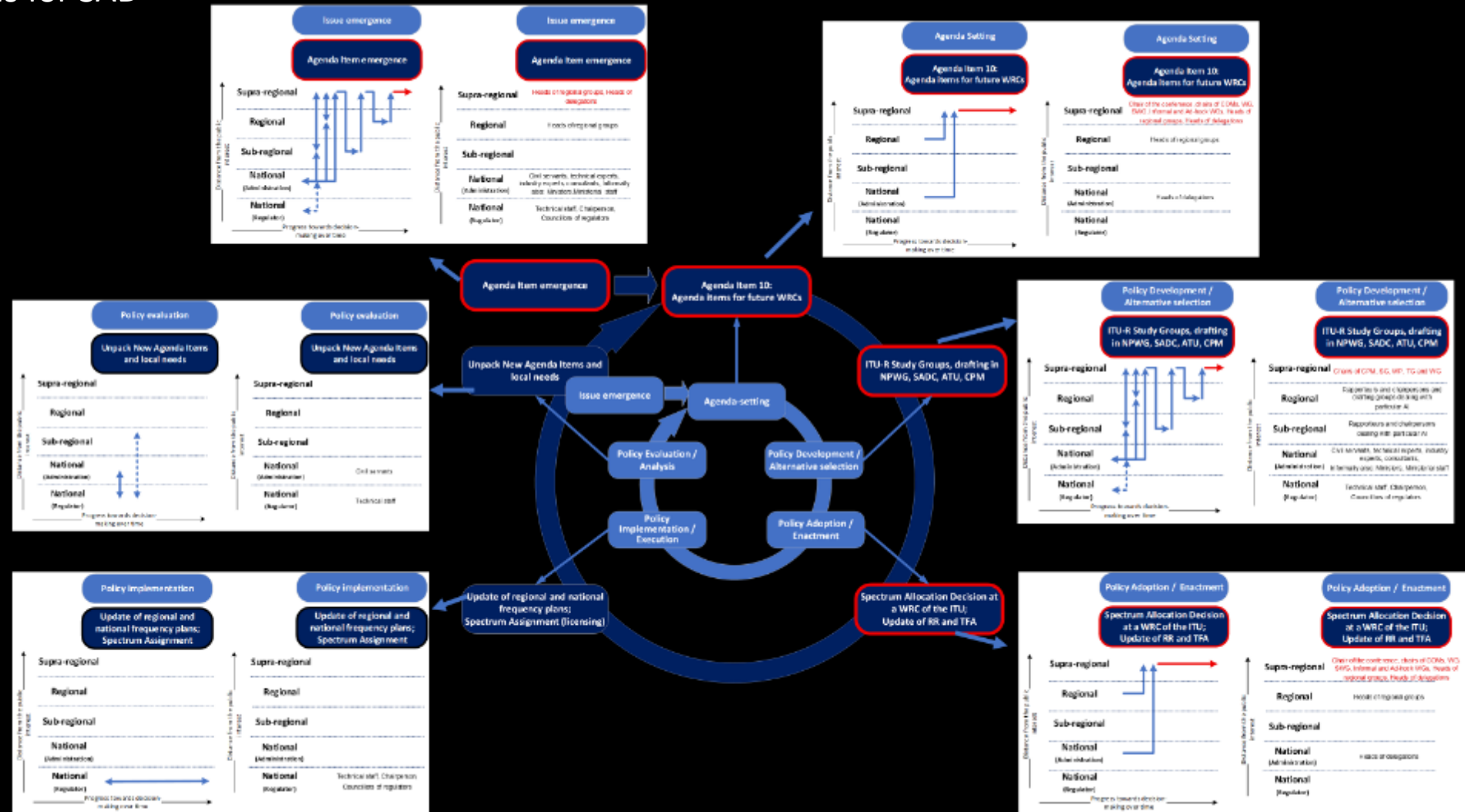
Author's visualisation of actors in Capture Theory



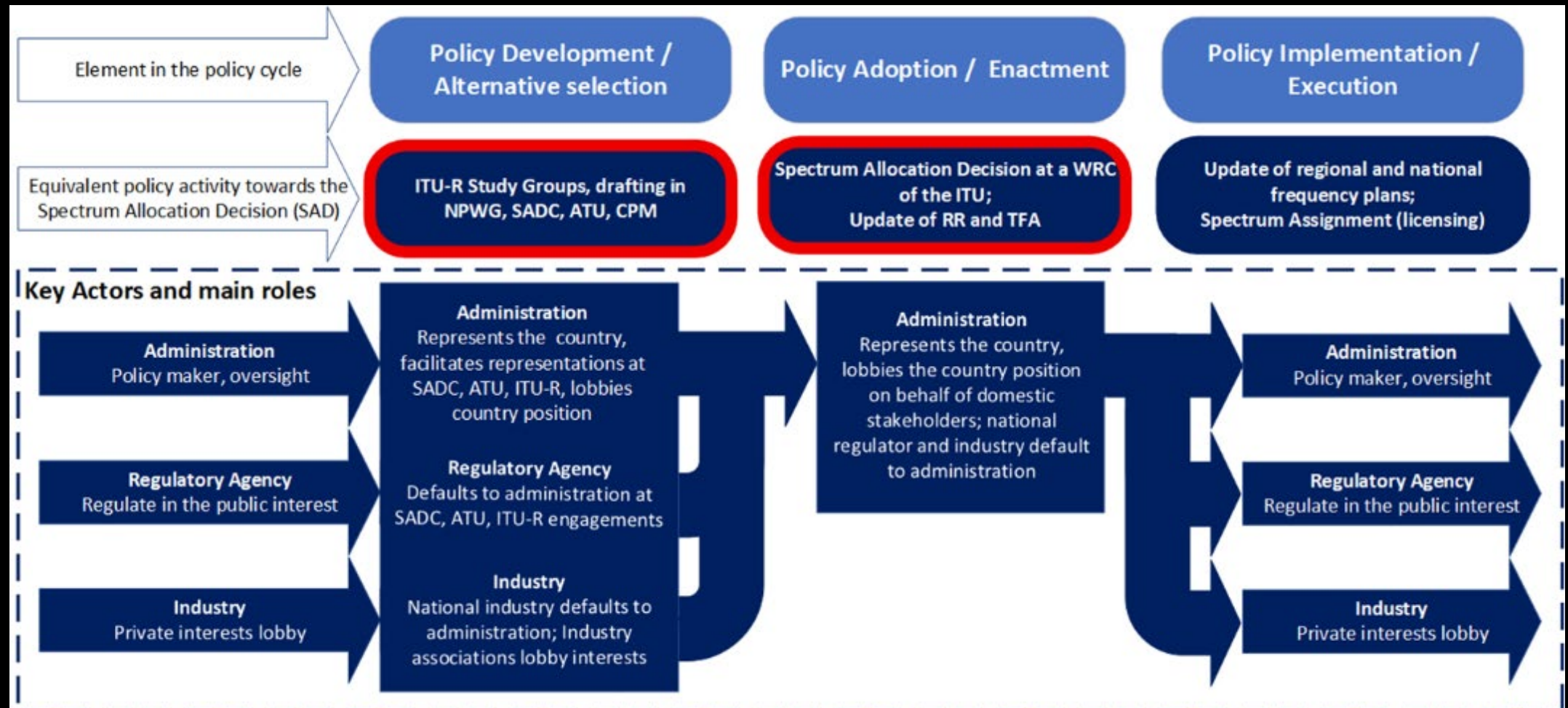
Target level	Target level (expanded)	Target actors	Roles and responsibilities
Legislative level	Legislature (Parliament)	Members of legislator, ministerial staff, political parties	Makes laws that govern the sector, establish the regulator and delineates executive powers (such as international representation at ITU), monitors the executive layer of government
Administrative level	Government (Administration)	Ministerial staff, heads of government departments and units charged with international spectrum matters	Convenes NPWG, represents the country and facilitates representations at SADC, ATU, ITU-R level, seeks cabinet approval for country position ahead of WRC, lobbies country position at WRC
	Regulator	Councilors and chairperson, heads and technical staff of regulator	Contributes to NPWG, tracks ITU-R studies, under leadership of government department contributes to regional meetings, following WRC updates frequency plan, pursues spectrum assignment

Differentiation by level and time

- Campaign-based capture
- Capture targets over time
- Supra-regional focus for SAD



Revolving roles

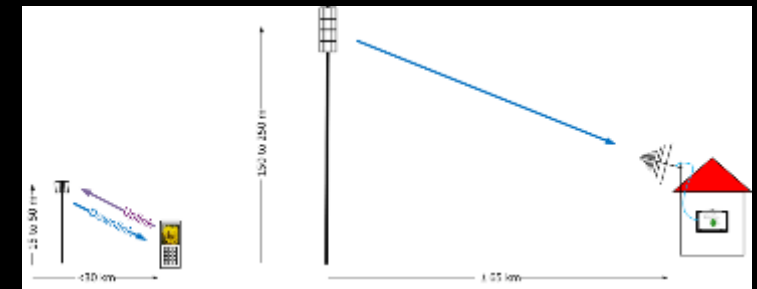
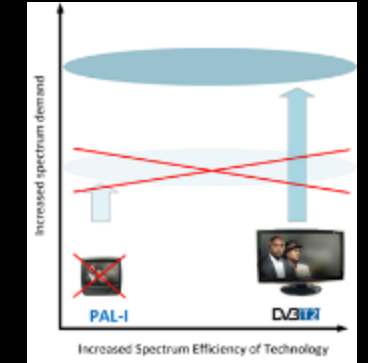
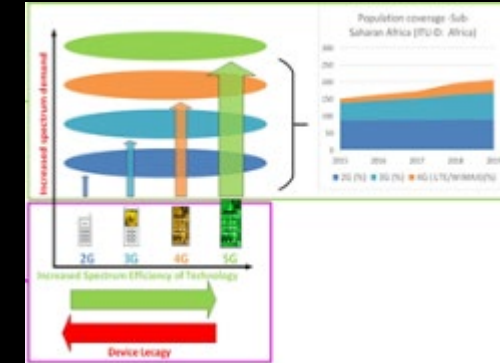
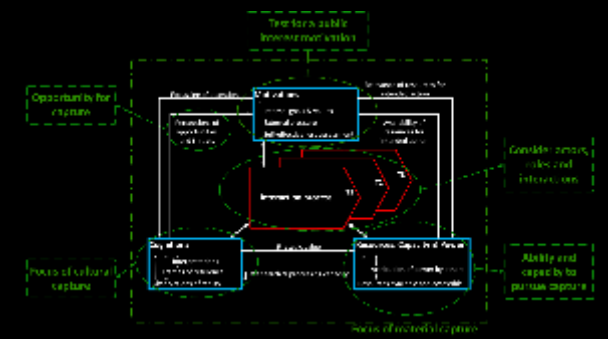


Contributions to theory in summary

- Methodological - Integration of CIT and CT:

A contextual capture theory of international spectrum governance

- Market-driven approach to spectrum assignment may not deliver efficient use of spectrum as premised in theory
- Unpacking propagation advantages at UHF and the overstated projections of lower-cost for mobile
 - Highlighting the wide-scale acceptance (see 6.3) of the assertions and projected savings without interrogation of the assumptions or accuracy of the study.
- Cause and effect of changes in broadcasting
 - Push and pull factors
 - Poor energy supply, inconsistent regulation, editorial interference, maladministration, corruption and capture



Limitations and future work

Limitations and future work

Limitations

- Input limitations
 - No interview or focus group input from Comoros, DRC and Madagascar
 - Politicised environment
- Limitations of findings
 - Snap-shot of time
 - Snap-shot of one WRC Agenda Item at one WRC

Future work

- Impact on democracy from eroding of broadcasting that is considered “a pillar of democracy”
 - Impact of false news and lacking debate in the public sphere
- Focus on spectrum governance, not only economic and engineering elements
- Identification and mitigation of potential capture risks in spectrum policy making and allocation (international focus)
 - Material capture
 - Cultural capture
- Generalisation of a contextual capture theory of international spectrum governance to a contextual capture theory of international governance

Significance and originality

Significance

- Substantial end-to-end review of a 4-year-study-cycle
- Counters the prevailing techno-economic analysis
- Critical review of the epistemic quality of decisions framed by cognition, motivations, resources and power of those interacting thereon
- SADC focus
- Finds a disconnect from the public interest and SAD at risk of capture
- Calls for diligent approach to spectrum allocation processes that would
 - prioritise the public interest
 - identify potential capture targets and captors, and
 - pursue appropriate mitigation measures
- UHF band study is generalisable to all future SAD
 - to serve administrators and regulators in SADC and
 - to provide insights on the risk of undue influence
- Lobbies for stronger public interest orientation in spectrum, broadcast and broadband policy matters

Originality

- Pursued creative originality by augmenting the methodology and data collection tools and in looking beyond my own horizon and those prevalent in literature
- Theoretical originality: A contextual capture theory of international spectrum governance
- Using multiple overlapping data-sets and avoiding a qualitative comparison (e.g. FIW ratings) but using the data as proxy for the pursuit of the public interest, among others, and benchmarking the SADC against other regions
- Experiencing the interactions
- The SADC perspective
 - Unique challenges in the region (socio-economic, political)
 - The plight of the subject matter expert
 - The SADC citizen that cannot afford the so-called “connected world” and does not fit the customer-profile lobbied for

Overarching view on perspectives held

		Proponents for Change (Seeking an allocation to mobile)	Opponents to Change (No Change, retain for broadcasting)
Worldview	Spectrum allocation to	Maximise economic benefit	Serve the Public Interest
	Service	The future is broadband	Critical for democracy
	Services to	Customers	Citizens
Motivation	UHF spectrum required for	Growth	Survival
Resources	Influence	Global industry and operators	Broke national broadcasters
	Lobby	Globally organised	Unorganised

Questions and Answers

Attributions

Image of 2012 Radio regulations, ITU	https://www.itu.int/en/history/ImagesOverviewOfITUHistory/2012-RadioRegs-1.jpg
AfriSAC, ATU	https://atuuat.africa/wp-content/uploads/2025/08/spectrum.jpg
BOCRA logo	https://s47139.pcdn.co/wp-content/uploads/2024/11/Botswana.png?ver=1749739125
ICASA logo	https://www.icasa.org.za/uploads/files/PNG-ICASA-LOGO-HI-RES.png
CRAN logo	https://www.cran.na/wp-content/uploads/2024/09/CRAN-Logo-01.png
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ESCCOM logo	https://www.esccom.org.sz/
ICTA log	https://www.icta.mu/
Images of broadcast and mobile tower and WRC-23 meetings	by author
Africa (SADC map)	Produced by author based on Global Administrative Boundaries. https://gadm.org