Aligning the various water management programs, projects and initiatives in South East Queensland is a synergistic opportunity that has multiple widespread benefits. How that is best achieved continues to elude the implementing organisations.

Integrated urban water mangement in SEQ and the role of water models

Workshop outputs – 28 March 2019

Piet Filet, Pablo Orams Witting, Chris Tanner and Brian McIntosh

Introduction and workshop purpose

The South East Queensland Regional Plan (SEQRP) includes the objective of 'enabling an integrated approach to the whole of catchment planning and management that is capable of linking the ecology and hydrology of cities to their region whilst accommodating urban and peri-urban growth adapted to a changing climate'. In this regard the CRC Water Sensitive Cities is working with the Queensland Water Modelling Network (an initiative of the Department of Environment and Science) to better understand links, gaps and opportunities for collaborative models and systems so as to achieve SEQRP objectives. At the workshop we explored technical and governance arrangements supporting the above.

The workshop was designed to:

- Opportunistically involve participants attending the CRC Water Sensitive Cities Conference in a problem-solving workshop on the effective use of urban water models, tools & DSS;
- Consider the role of Collaborative Models and Systems for Integrated Water Management for this regional case study;
- Map the synergies, gaps, opportunities that highlight key ways in which the use of models and systems can add value to otherwise separated (possibly siloed) planning processes through promoting learning, organisational coordination and a consideration of aggregate impacts and cross-initiative synergies.

N.B. The term models is used in an inclusive way to capture all tools, DSS and other enabling systems, e.g. offset framework for an implementation program, that help describe the problems and solutions in water management issues.

Workshop outcomes are available to:

- Inform SEQRP actions, possibly building the case for strategies for a water sensitive SEQ
- Inform inputs for the running of the end May/early June QWMN CoP event – that has a Climate Impact focus on water models

The information that is contained in this report is a faithful sharing of the group activity outputs. It was not feasible that the workshop be complete in dealing with all aspects of the topic. This workshop report provides a record of the ideas that can be used as part of the outcome process and next step actions discussed in this workshop report.

Mapping water projects in SEQ

Scope/intent and categorization of current SEQ water projects.

In the lead up to the workshop Chris Tanner circulated a set of projects, Appendix 1, that are but a part of the collective efforts to achieve the integrated water management approach that delivers on multiple outcomes desired for SEQ. Using this information and other group knowledge, three small groups mapped the distribution and location of these various projects in SEQ (Appendix 2).

Of interest is that, the various projects have a focus on a range of factors that are associated with integrated water management, namely:

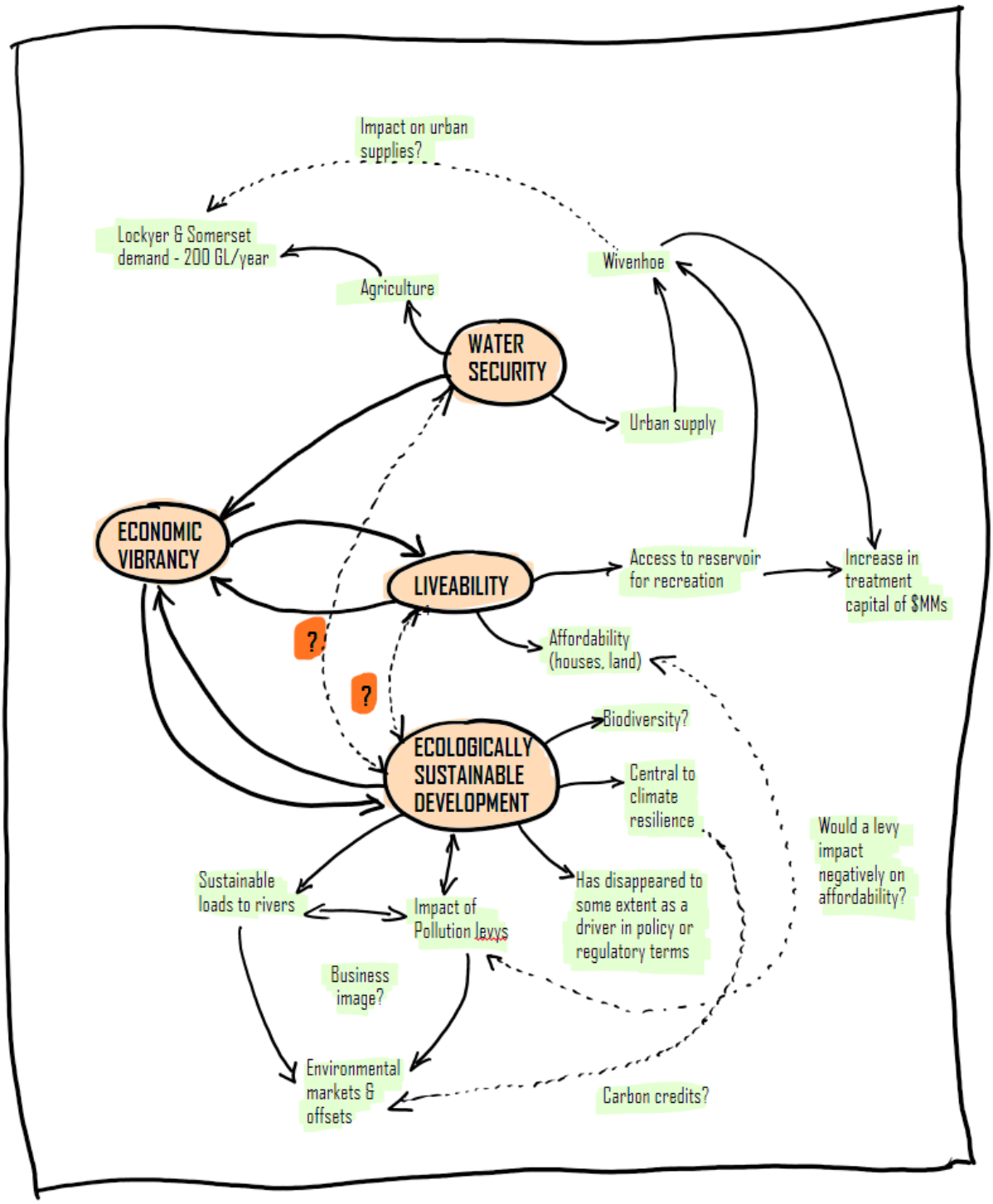
a. Population growth
b. Sediment
c. Water security – urban and agriculture
d. Restoring waterways
e. Liveability, Health and Wellbeing
f. Offset, Environmental markets

What is it that really underpins the importance of this integrated water management approach

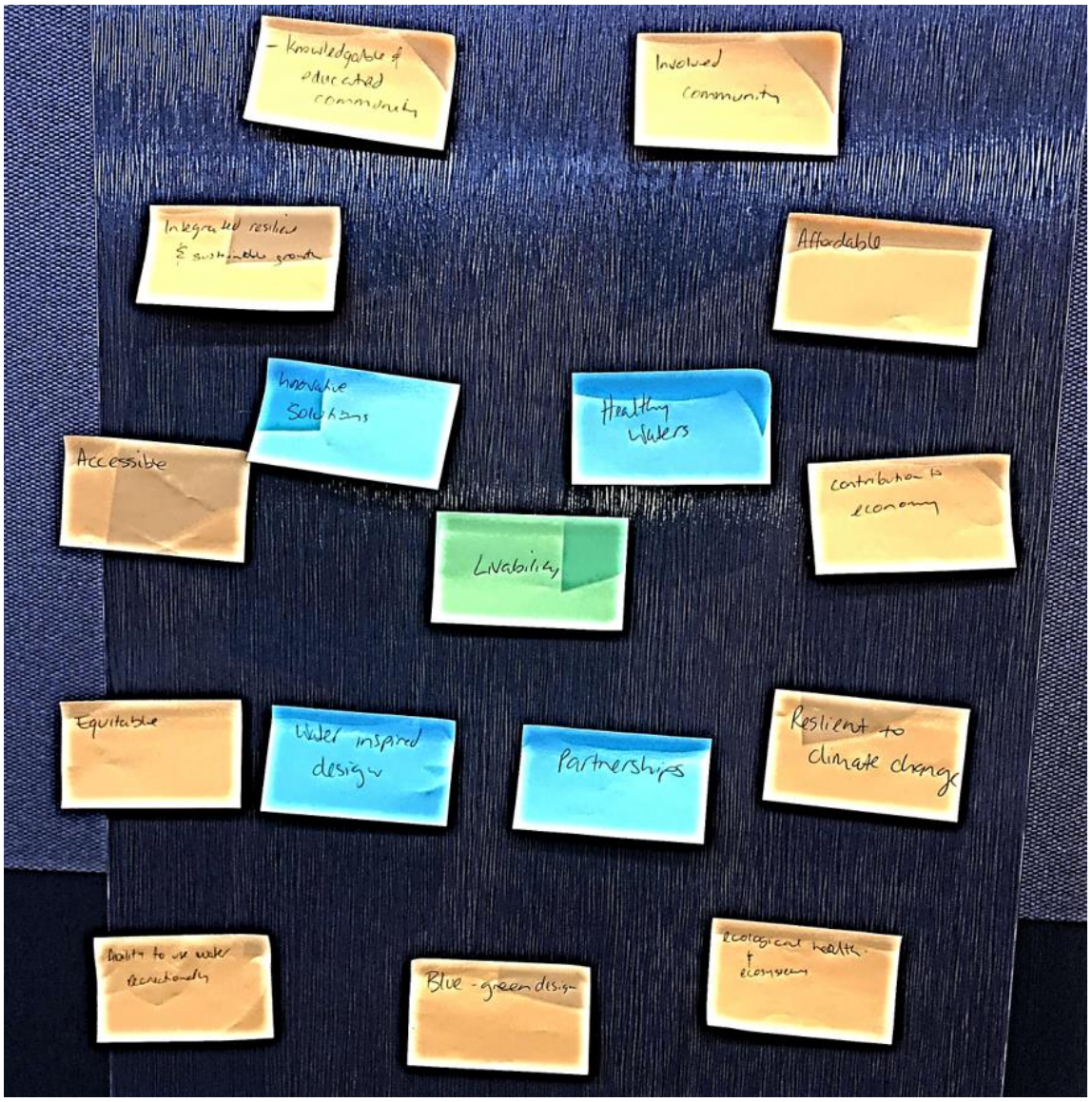
Based on the awareness of projects each group was then asked to better describe what was it that was actually driving the implementation of these projects. In addition, each group also included aspects that they also saw as being aspects that should be driving the need for theses projects. As a result, a nice complex array of issues and drivers are presented and each group has provided a format and array that best matches the depiction of their collective thinking.

The following three responses are quite diverse, but all provide a rich insight into the inter-relationships of issues, projects and values.

GROUP 1

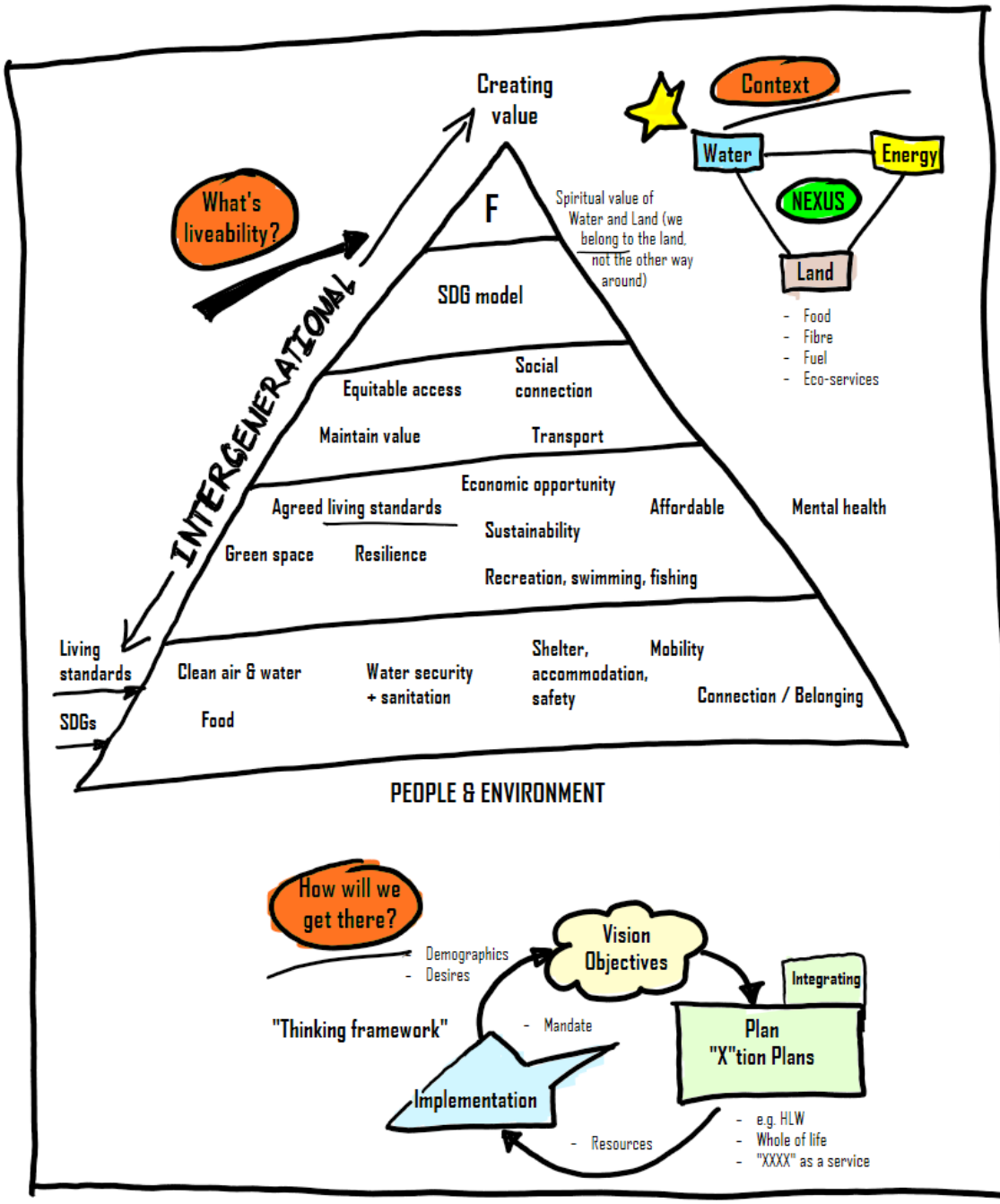

Impact on urban supplies?
Lockyer & Somerset demand - 200 GL/year
Agriculture
Wivenhoe
WATER SECURITY
Urban supply
ECONOMIC VIBRANCY
LIVEABILITY
Access to reservoir for recreation
Increase in treatment capital of $MMs
?
?
Affordability (houses, land)
Biodiversity?
ECOLOGICALLY SUSTAINABLE DEVELOPMENT
Central to climate resilience
Would a levy impact negatively on affordability?
Sustainable loads to rivers
Impact of Pollution levys
Has disappeared to some extent as a driver in policy or regulatory terms
Business image?
Environmental markets & offsets
Carbon credits?

GROUP 2



This array linked to a Livability outcome (centre), with key process steps (in blue) are driven by a suite of issues (brown tags). This framework is what underpins the Gold Coast Water Strategy.

GROUP 3

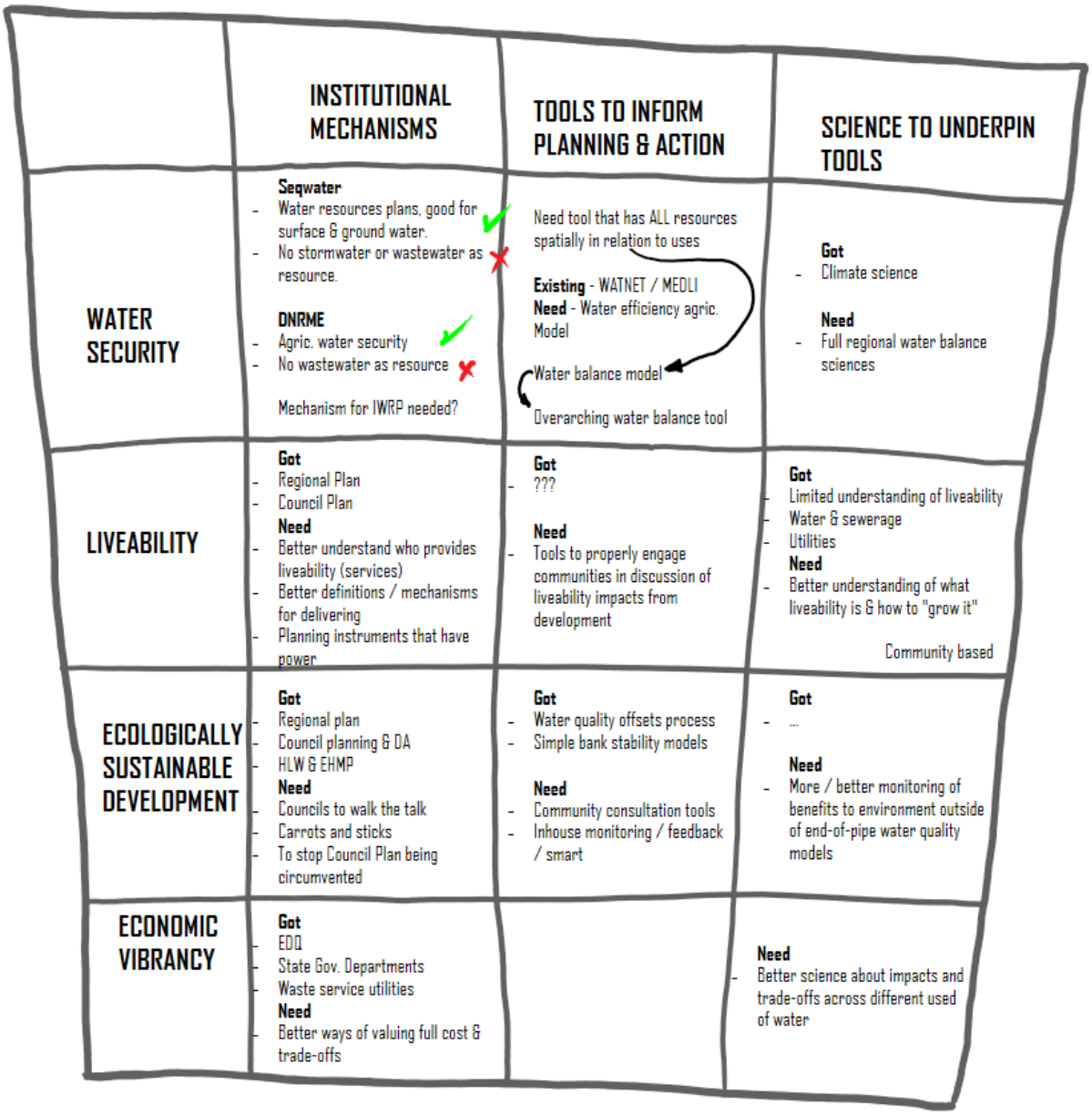

Creating value
Context
Water
Energy
NEXUS
Land
- Food
- Fibre
- Fuel
- Eco-services
What's liveability?
INTERGENERATIONAL
F
Spiritual value of Water and Land (we belong to the land, not the other way around)
SDG model
Social connection
Equitable access
Maintain value
Transport
Economic opportunity
Agreed living standards
Affordable
Mental health
Sustainability
Green space
Resilience
Recreation, swimming, fishing
Living standards
SDGs
Clean air & water
Food
Water security + sanitation
Shelter, accommodation, safety
Mobility
Connection / Belonging
PEOPLE & ENVIRONMENT
How will we get there?
Demographics
Desires
"Thinking framework"
Vision Objectives
Mandate
Integrating
Plan "X"tion Plans
Implementation
Resources
- e.g. HLW
- Whole of life
- "XXXX" as a service

Exploring what is the real purpose of these initiatives

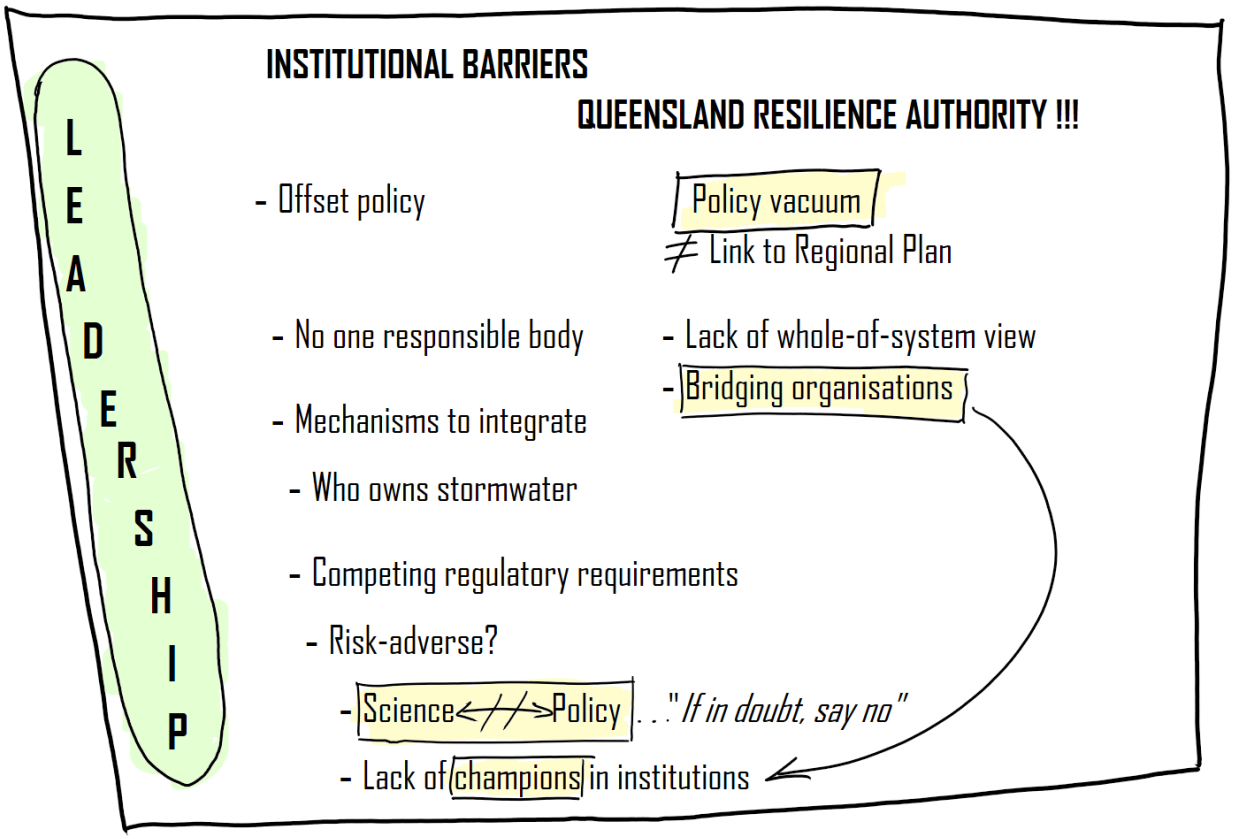
Linking key outcomes with institutional mechanisms, the role of water models and other tools to support and the science to underpin the tool

The systems maps from the previous task, were used as a basis for considering what are the best means to achieve these outcomes and what might support that progress. Groups 1 and 3 provided a breakdown of the various elements, whereas Group 2 took a simplistic holistic view that the implementation was principally linked to the issue of leadership.

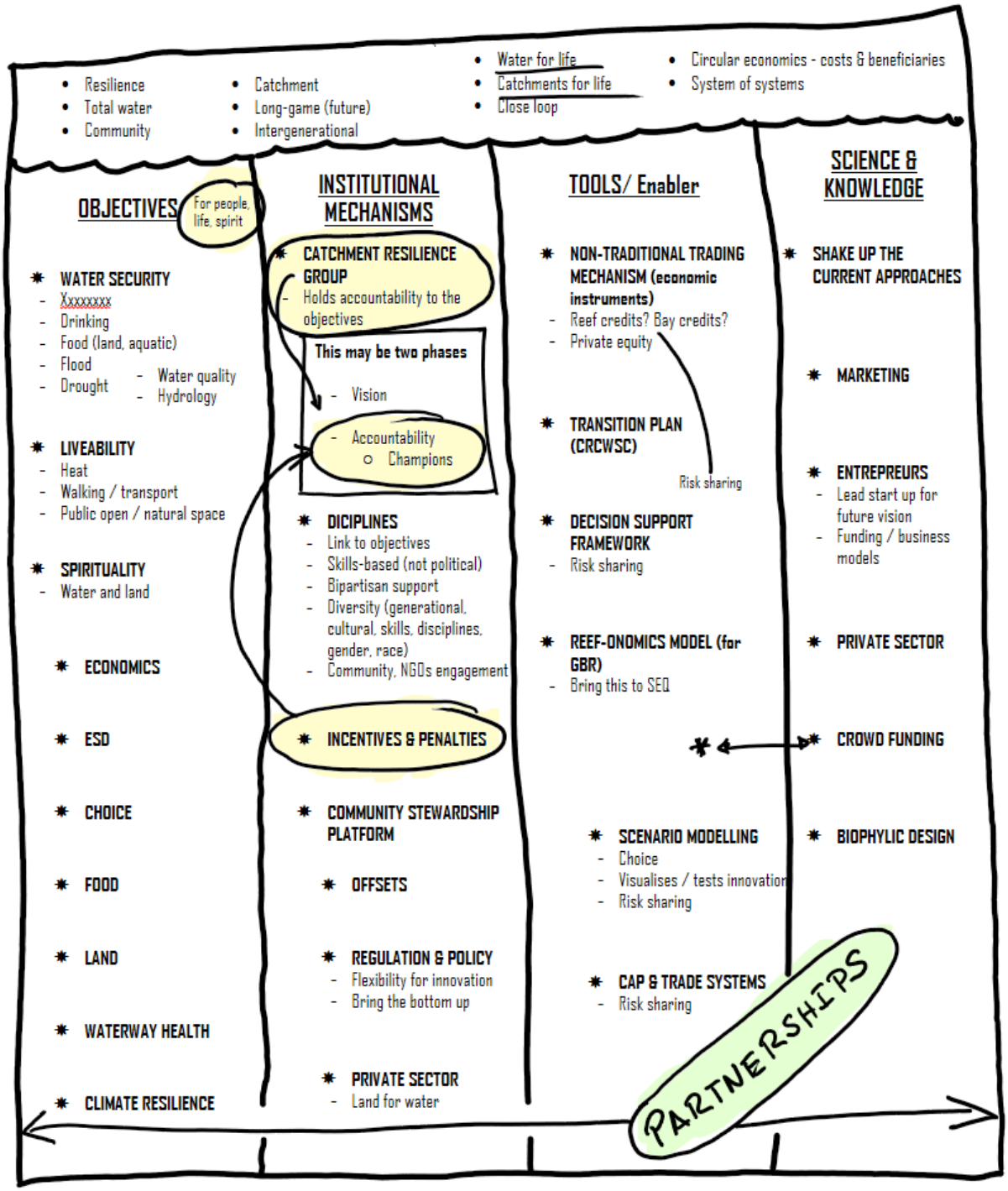
GROUP 1



GROUP 2


INSTITUTIONAL BARRIERS
QUEENSLAND RESILIENCE AUTHORITY !!!
LEADERSHIP
- Offset policy
Policy vacuum
≠ Link to Regional Plan
- No one responsible body
- Lack of whole-of-system view
- Bridging organisations
- Mechanisms to integrate
- Who owns stormwater
- Competing regulatory requirements
- Risk-adverse?
- Science<//>Policy . . . "If in doubt, say no"
- Lack of champions in institutions

GROUP 3


Resilience
Total water
Community
Catchment
Long-game (future)
Intergenerational
Water for life
Catchments for life
Close loop
Circular economics - costs & beneficiaries
System of systems
OBJECTIVES
For people, life, spirit
WATER SECURITY
Xxxxxxxx
Drinking
Food (land, aquatic)
Flood
Drought
Water quality
Hydrology
LIVEABILITY
Heat
Walking / transport
Public open / natural space
SPIRITUALITY
Water and land
ECONOMICS
ESD
CHOICE
FOOD
LAND
WATERWAY HEALTH
CLIMATE RESILIENCE
INSTITUTIONAL MECHANISMS
CATCHMENT RESILIENCE GROUP
Holds accountability to the objectives
This may be two phases
Vision
Accountability
Champions
DICIPLINES
Link to objectives
Skills-based (not political)
Bipartisan support
Diversity (generational, cultural, skills, disciplines, gender, race)
Community, NGOs engagement
INCENTIVES & PENALTIES
COMMUNITY STEWARDSHIP PLATFORM
OFFSETS
REGULATION & POLICY
Flexibility for innovation
Bring the bottom up
PRIVATE SECTOR
Land for water
TOOLS/ Enabler
NON-TRADITIONAL TRADING MECHANISM (economic instruments)
Reef credits? Bay credits?
Private equity
TRANSITION PLAN (CRCWSC)
Risk sharing
DECISION SUPPORT FRAMEWORK
Risk sharing
REEF-ONOMICS MODEL (for GBR)
Bring this to SEQ
SCENARIO MODELLING
Choice
Visualises / tests innovation
Risk sharing
CAP & TRADE SYSTEMS
Risk sharing
SCIENCE & KNOWLEDGE
SHAKE UP THE CURRENT APPROACHES
MARKETING
ENTREPREURS
Lead start up for future vision
Funding / business models
PRIVATE SECTOR
CROWD FUNDING
BIOPHYLIC DESIGN
PARTNERSHIPS

Highlights and next steps

Themes of interest and observations that arose in the workshop included:

- Common focus on Livability and what that might mean for a "Water Enabled" design and management process;
- Absence of a regional 'sustainability' vision i.e. the lack of a small set of sustainability goals that provide focus, are easily understood and align with community expectations and which various institutions are aligned with;
- A need to better plan rural and urban areas together in relation to thinking about water and land sustainability and security.

In terms of next steps, a suite of steps that align with both the interests of the CRCWSC & QWMN include:

1. **A Project Register:** CRCWSC to ask relevant local agencies and utilities to summarise their current and future projects to aid the compilation of a full draft list of these and to put in place a mechanism to keep it updated and distributed, for the purpose of enabling collaboration. A request to all workshop participants to be made and initial set to be collected by the CRCWESC Brisbane team.

2. **Liveability Case Studies:** CRCWSC to complete some case studies showcasing how more liveable outcomes can be achieved with water as an enabler (*Liveability is all of those things that make a place somewhere people want to live, communities flourish and businesses choose to invest. To be long lasting and resilient, a liveable city or region must consider the needs of future generations and use systems thinking to understand and respond to shocks and long-term change)*

3. **SEQ Water (Sustainable Equitable Queensland Water)** road map: a paper that further assimilates some of the workshop ideas, then explores in more depth the pathways to develop the types of enabling structures, on-ground practices and socio-political capital that might be necessary to enable integrated water management

4. Explore the various urban and rural collaborations initiatives in place in SEQ. In particular:

    a) progress discussions with various peak rural industry groups, through the Flood Community of Practice, on the utility and value of the application "Fluvial Transect of SEQ" for linking rural and urban interests

    b) Explore the rural and urban connectivity in terms of connectivity of water models along/down the catchment sequence and scales at the next QWMN "Sustainable Landscape" workshop planned for early June

Appendix 1 Preliminary Mapping of Projects related to SEQRP Delivery Action for a Water Sensitive Region

Entity	Project	Primary Purpose	Primary Legislation	Other Links to…
DSDMIP	Regional Plan Implementation Actions	Multiple Delivery Actions: Strategic Assessment Natural Hazard Management SEQ NRM Plan Water Sensitive Region Climate Change Mitigation and Adaption SEQ Water Security Program Resilient Rivers Initiative Density and Diversity QDesign Qld Housing Strategy	Planning Act SPP July 2017	
	Green Corridors	Green corridors for SEQ, benefitting liveability	State Architect	
Seqwater	Water Security Plan V3	Seqwater planning document for the delivery of safe, secure and cost-effective water and catchment services to their customers and communities across South East Queensland	Planning Act, Water Supply (Safety and Reliability) Act,	Local Authorities - waterway management DNRME

Entity	Project	Primary Purpose	Primary Legislation	Other Links to…
			Environmental Protection Act	WSAA DES
	Decentralised Planning	To get a better understanding of what impact the adoption of decentralised systems at scale would have on their business and operations – the mooted stomwater harvesting scheme at Aura (Cal South) is an example	Planning Act, Water Supply (Safety and Reliability) Act, Environmental Protection Act	Local Authorities - waterway management DNRME WSAA DES
	Liveability	To get an understanding of how liveability ideas and aspirations may change Seqwater's water demand profile, e.g. if increased vegetation and water in open space was adopted to manage urban heat. Also links to climate change adaption, human health and wellbeing	Planning Act, Water Supply (Safety and Reliability) Act, Environmental Protection Act	DNRME WSAA DES
DNRME	Water Planning Framework	Defining water availability, frameworks for sustainable management, water allocation and natural ecosystem degradation rehab, and priorities for future water needs	Water Act	Overarching framework for catchment water use, though
	Flood Mitigation	Flood studies Mitigation methods Dam Safety and Management	Water Act	

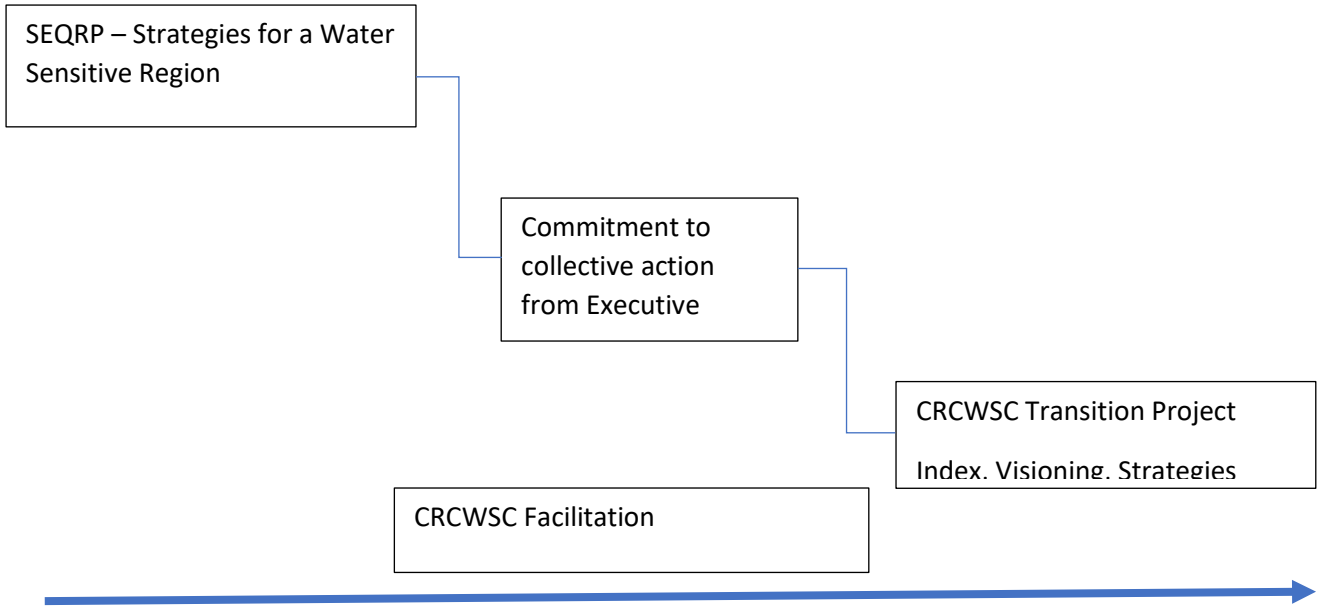
Entity	Project	Primary Purpose	Primary Legislation	Other Links to…
DES	Sustainable Loads	Pollutant load thresholds for long term sustainable waterway management	Environmental Protection Act	Planning Act EPP Water Local Authorities HL&W
	WQO Small Development	Simple, effective methods for implementation of stormwater quality management BMP's at small developments	Environmental Protection Act	Planning Act EPP Water Local Authorities HL&W
	Climate Change Adaption, Human Health and Wellbeing Climate Change Adaption Plan	Adaption by leadership, education/knowledge, management, collaboration and cross sector integration	Environmental Protection Act	QFES Health Act Long term sustainability
	QWMN	Integration of urban and rural catchment modelling capability, building a suite of models to inform best practice development and for a DSS	Environmental Protection Act	Planning Act EPP Water Local Authorities NRM Plan HL&W

Entity	Project	Primary Purpose	Primary Legislation	Other Links to…
QFES	Rising awareness of impact of urban heat			Planning Act Climate Change Adaption, Human Health and Wellbeing Climate Change Adaption Plan
Port of Brisbane	Sediment Load Offsets, bank stabilisation Lockyer Ck	Prevent sediment load in the upper river catchments	DES	All point and diffuse source polluters – primarily treated WW & SW Local Authorities Utilities Environmental trading markets
QRA	SFMP	Completion of Phase 3 of the Strategic Flood Management Plan – mooted release Feb/March 2019	Water Act?	Local Authorities to complete Local Flood Management Plans as SFMP Phase 4
	Resilience Planning	Embed long term resilience into land use decision making and practice	Planning Act	

Entity	Project	Primary Purpose	Primary Legislation	Other Links to…
EDQ	Various PDA Flagstone Focus	Determine a sustainable way to manage wastewater at Flagstone, and in parallel create highly liveable places – note Flagstone is hot and dry with half the average rainfall of Brisbane	Planning Act – recognising that the PDA's transfer to Local Authorities in time Economic Development Act	Local Authorities Environmental Protection Act
QUU	Effects/Risked Based Planning	To more cost effectively manage wet weather sewerage overflows, with a net positive human and environmental health impact	Planning Act, Water Supply (Safety and Reliability) Act, Environmental Protection Act, SEQ Code	Local Authorities - waterway management DNRME WSAA DES
	Servicing Plans	Guides infrastructure planning and business decisions that support water, sewerage and related products and services (recycled water, biosolids, biogas, etc.) to existing and future customers within the catchment.	Per above	Seqwater Local Authorities DNRME DES
	Oxley Ck Transformation	A plan to guide the use and development of the Oxley Ck corridor - the catchment is a broader and related planning issue	BCC City Plan	QUU & BCC (who is the main driver) are collaborating

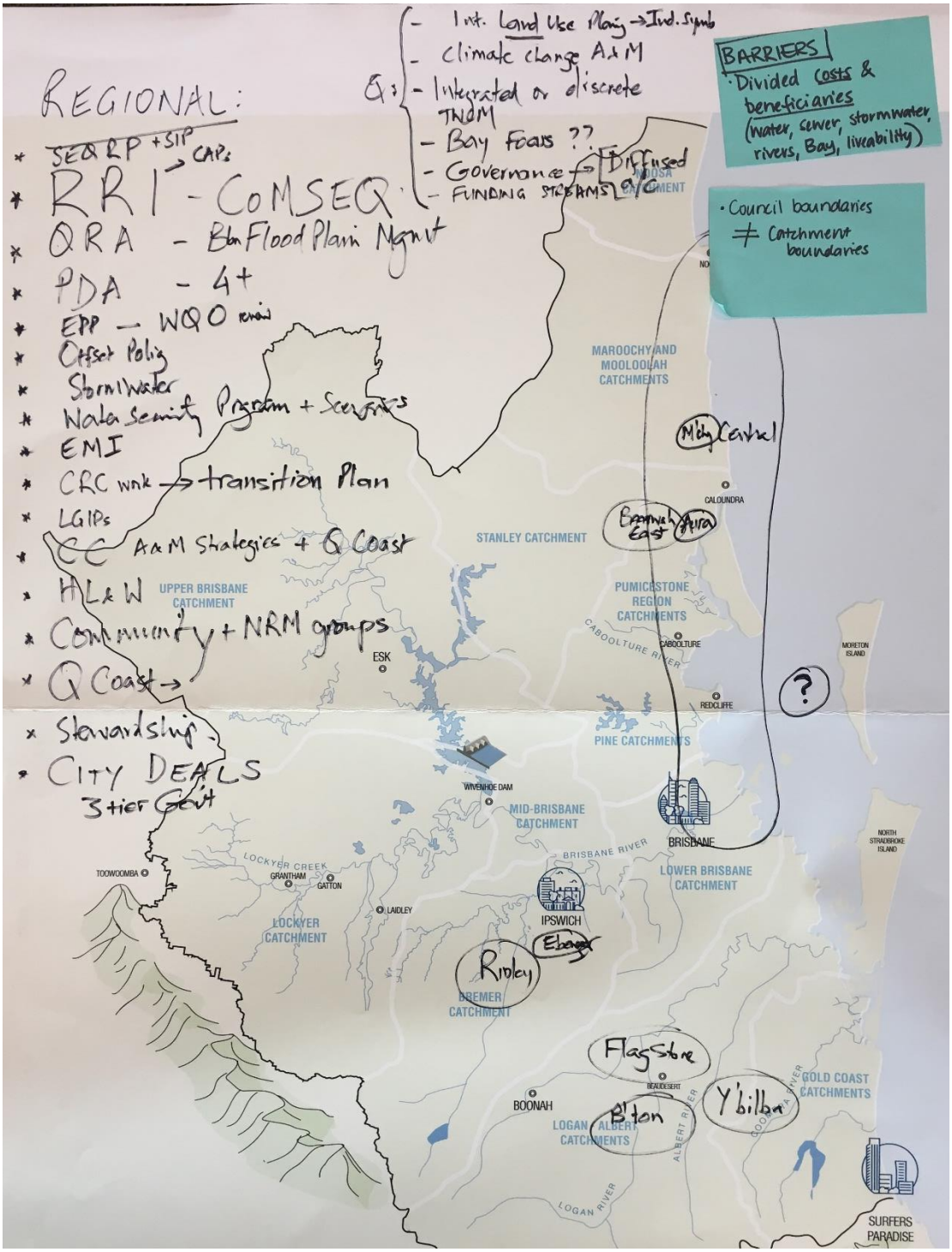
Entity	Project	Primary Purpose	Primary Legislation	Other Links to…
Gold Coast W & W	Water Strategy and Transition to a Water Sensitive City Integration of water and land use planning	Strategies for transition to a water sensitive city The roll-out of a recycled water system servicing major commercial/industrial users and for green space irrigation, benefitting liveability outcomes Research and investigation about how to integrate water and land use planning	Planning Act, Water Supply (Safety and Reliability) Act, Environmental Protection Act, SEQ Code	CoGC
Unity Water	WIS Maroochydore PAC demo Caboolture West Beerwah East Cal South / Aura	Wamuran Irrigation Scheme, in parallel with CWIA using RW from the development to boost local agriculture production A demonstration of water recycling at the new Maroochy PAC Development / investigation to Beerwah east servicing and environmental impact The mooted stormwater harvesting project by Aura and Seqwater	Planning Act, Water Supply (Safety and Reliability) Act, Environmental Protection Act, SEQ Code	EDQ SCRC
Local Authorities	Land Use Planning	Multiple new land release area and infill development planning, with a growing consideration of the benefits of integration of	Planning Act	Interface with water utilities

Entity	Project	Primary Purpose	Primary Legislation	Other Links to…
		water management and other infrastructure, but lacking clear supportive frameworks		
BCC	Transport Corridor Greening, Norman Creek Infill case Study Clean, Green & Sustainable	Modelling of Urban Heat impacts along with the ways of mitigating this Investigation of infill typologies to understand and mitigate water impacts	Planning Act Environmental Planning Act	Interface with water utilities
SEQCOM	Resilient Rivers	The Resilient Rivers Initiative was launched in December 2014 with the aim of improving the health of SEQ's waterways by delivering a coordinated approach to catchment management	Planning Act Environmental Planning Act	Environmental Markets
WSAA	Liveability Committee	Understand and influence the implications of government consideration about liveability on water utilities services		QUU and Others

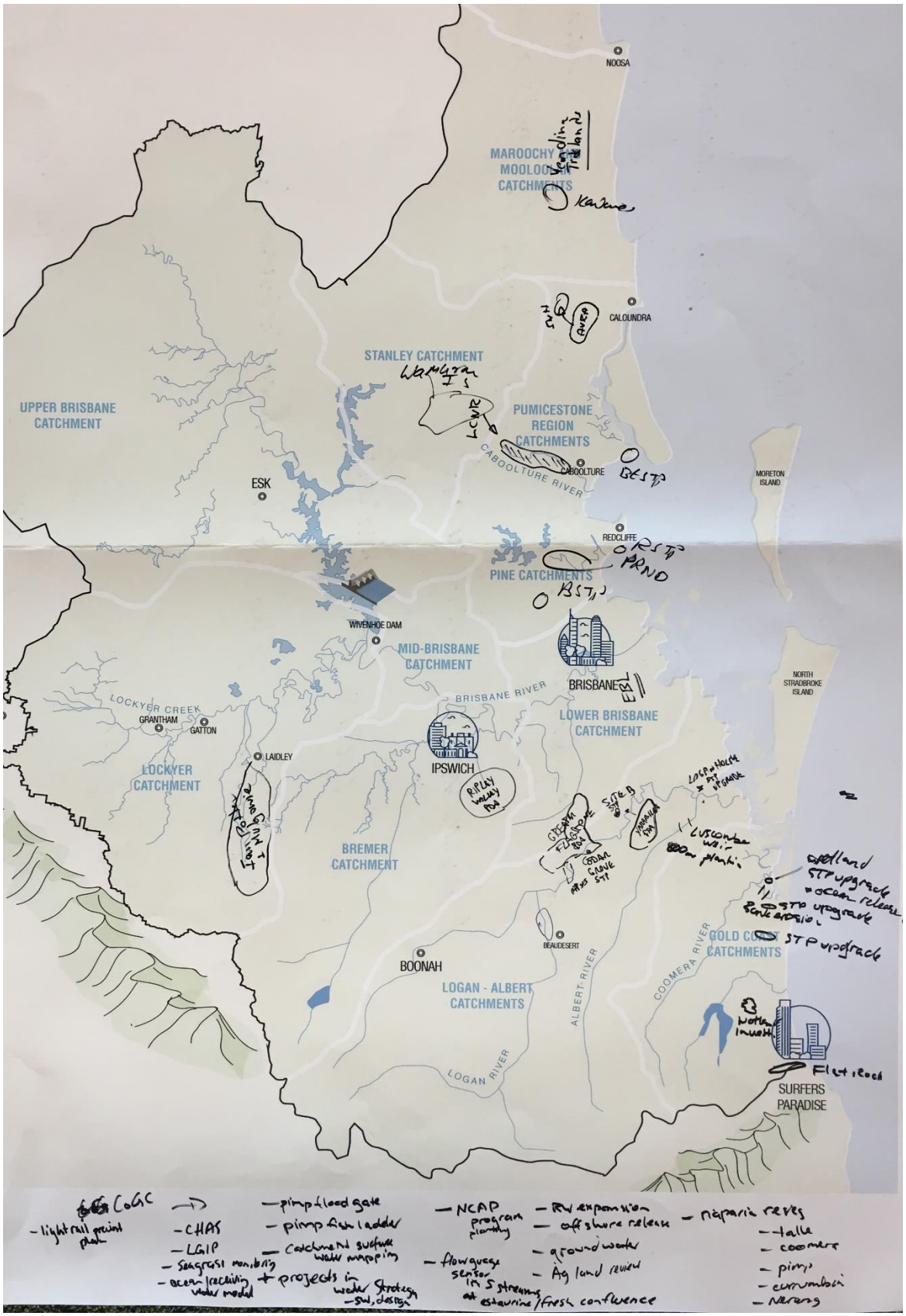

SEQRP – Strategies for a Water Sensitive Region
Commitment to collective action from Executive
CRCWSC Transition Project
Index, Visioning, Strategies
CRCWSC Facilitation

Appendix 2 – Locations of various water management projects in parts of SEQ

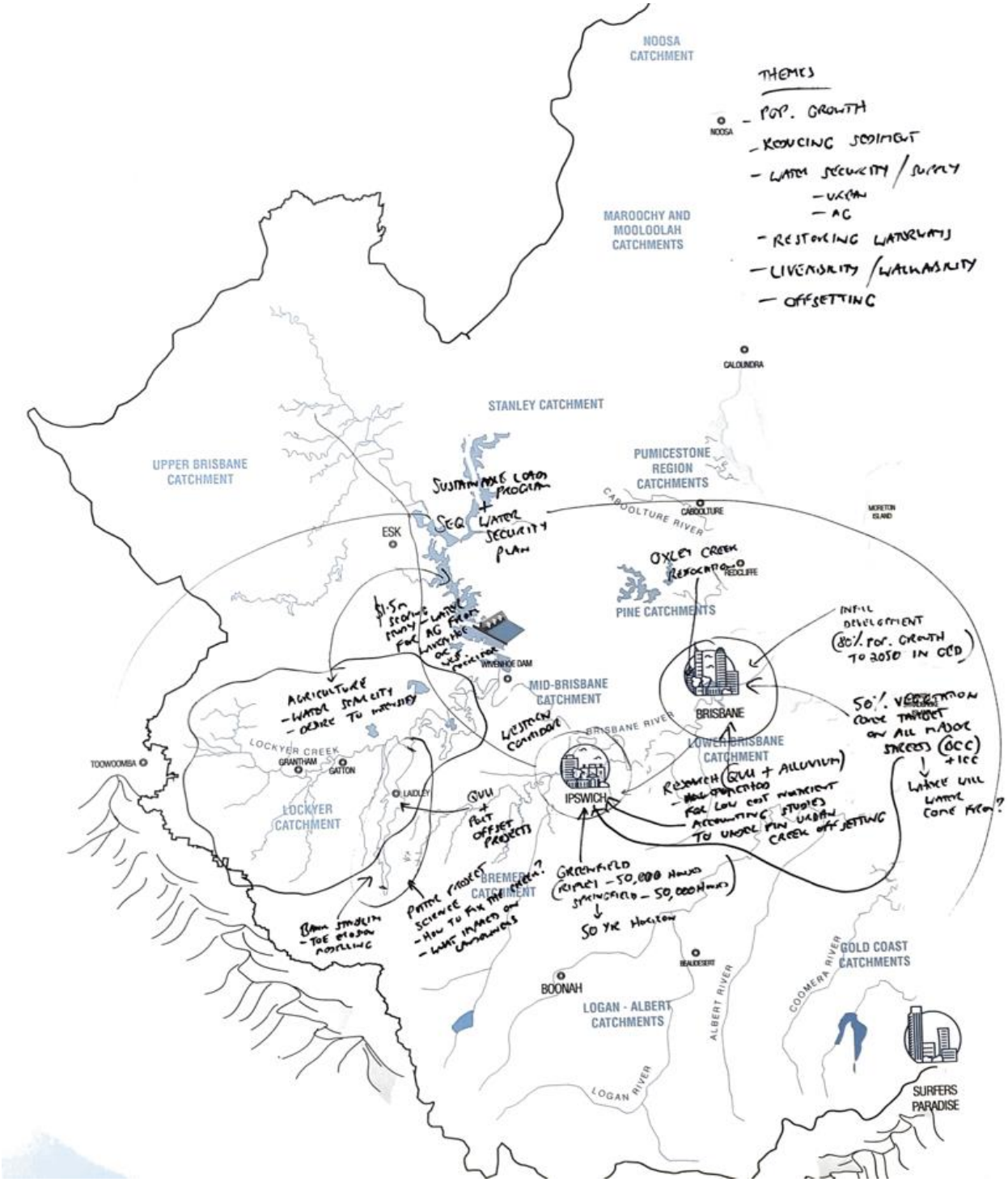
GROUP 1



GROUP 2


NOOSA
MAROOCHY MOOLOOLAH CATCHMENTS
CALOUNDRA
STANLEY CATCHMENT
UPPER BRISBANE CATCHMENT
PUMICESTONE REGION CATCHMENTS
CABOOLTURE
CABOOLTURE RIVER
MORETON ISLAND
ESK
REDCLIFFE
PINE CATCHMENTS
WIVENHOE DAM
MID-BRISBANE CATCHMENT
BRISBANE
NORTH STRADBROKE ISLAND
LOCKYER CREEK
GRANTHAM
GATTON
BRISBANE RIVER
LOWER BRISBANE CATCHMENT
LAIDLEY
IPSWICH
LOCKYER CATCHMENT
BREMER CATCHMENT
BEAUDESERT
BOONAH
LOGAN - ALBERT CATCHMENTS
ALBERT RIVER
COOMERA RIVER
GOLD COAST CATCHMENTS
LOGAN RIVER
SURFERS PARADISE
- light rail precinct plan
- CHAS
- LCAP
- seagrass monitoring
- ocean/receiving water models
+ projects in water Strategy - SW, design
- pimp flood gate
- pimp fish ladder
- catchment surface water mapping
- flow gauge sensor in 5 streams at estuarine/fresh confluence
- NCAP program
- RV expansion
- offshore release
- groundwater
- Ag land review
- riparian revegetation
- tallai
- coomera
- pimpi
- currumbin
- Nerang

GROUP 3


NOOSA CATCHMENT
THEMES
- POP. GROWTH
- REDUCING FOOTPRINT
- WATER SECURITY / SUPPLY
- URBAN
- AG
- RESTORING WATERWAYS
- LIVEABILITY / WALKABILITY
- OFFSETTING
NOOSA
MAROOCHY AND MOOLOOLAH CATCHMENTS
CALOUNDRA
STANLEY CATCHMENT
UPPER BRISBANE CATCHMENT
PUMICESTONE REGION CATCHMENTS
SUSTAINABLE LAND PROGRAM
SEQ WATER SECURITY PLAN
CABOOLTURE
CABOOLTURE RIVER
MORETON ISLAND
ESK
OXLEY CREEK
REDCLIFFE
PINE CATCHMENTS
WIVENHOE DAM
INFILL DEVELOPMENT (80% POP. GROWTH TO 2050 IN GCD)
AGRICULTURE
- WATER SECURITY
- DESIRE TO INTENSIFY
MID-BRISBANE CATCHMENT
BRISBANE
BRISBANE RIVER
LOWER BRISBANE CATCHMENT
50% VEGETATION COVER TARGET ON ALL MAJOR STREETS (GCC)
LOCKYER CREEK
GRANTHAM
GATTON
TOOWOOMBA
LADYLEY
LOCKYER CATCHMENT
IPSWICH
GVU + PILOT OFFSET PROJECTS
RESEARCH (GVU + ALLUVIUM)
- WATER QUALITY
FOR LOW COST NUTRIENT ACCOUNTING STUDIES TO UNDERPIN URBAN CREEK OFFSETTING
BREMER CATCHMENT
GREENFIELD (RIPLEY - 50,000 HOUSES SPRINGFIELD - 50,000 HOUSES)
50 YR HORIZON
BOONAH
BEAUDESERT
LOGAN - ALBERT CATCHMENTS
ALBERT RIVER
COOMERA RIVER
GOLD COAST CATCHMENTS
LOGAN RIVER
SURFERS PARADISE