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Comparing accounting designs for sustainability governance

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Abstract
A draft proposal for a capital-based framework of sustainable development indicators applicable to all countries, and at all levels of public administration within them, is under consideration by an expert working group convened under the auspices of the UNECE Conference of European Statisticians. Harmonising underlying accounting and information systems should facilitate widespread adoption of a small, universal set of indicators. If implemented, the proposal's communication design could contribute to the vertical and horizontal policy integration essential for effective sustainability governance. Implementing a design that shifts some distance from existing conditions of institutional diversity and autonomy throughout at least a million provincial and local government units is, however, a significant risk. This research-in-progress report identifies one recent case study, and one current, with Australian local authorities. Integrated assessments of change over time in a local community's natural, produced, and human capital stocks have been demonstrated in one case, and of change in a local community's governance capital and social capital in another. Results demonstrate that a common understanding on how assets are distributed over time and space can be achieved without the radical, top-down innovations under consideration through UNECE auspices. The combination of tools and methods used in the case studies also yields significant insights into some of the complexities of wicked policy problems. Clarifying the meaning of 'community engagement' or 'public participation' is advanced in one case study through a relatively new development in social network analysis.

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1. Introduction

Peskin (1998:377) sees formal systems accounting as producing "statistics needed to support policy actions, either by a business, household, or by the government." Transmitting an accounting message to support policymaking is a communication. Frascara (2006) defines a communication designer as a "designer of possibilities for communication: someone who uses existing contexts and adds to them through the best use of existing conditions – and through their modification – to strengthen the communicational power of the messages." Messages from social and environmental accounting researchers have been transmitted for at least three decades. Some commentators (e.g. Mathews 1997; Peskin 1998; Owen 2008) question whether such messages affect the accounting practices of their colleagues working in private and public sectors.

A capitals approach now seems favoured by many for strengthening the communicational power of social and environmental accounting messages. Recent (21st century) efforts in decision support for sustainability governance often reflect differences over time or space in the distribution of assets. Applications for the businesses, local communities, provinces, and nations of developed countries (e.g. Dyllick & Hockerts 2002; Smith 2003; Grosskurth & Rotmans 2005; Anielski 2007), and for the villages and nations of developing countries (e.g. Carney 2002; Pearce et al 2005), can be identified. This paper extends inquiry into the capitals approach to sustainability accounting as a communicational space for governance – a space created by communication designers where publics meet the message (Frascara 2006). It does so by comparing two accounting designs constructed in substantially different settings, but with similar materials and intent.

Following its fifth meeting in 2008, the Joint UNECE/Eurostat/OECD Working Group on Statistics for Sustainable Development (WGSSD) posted a draft report on to the Internet. The draft report - *A Framework for Sustainable Development Indicators* - (UNECE 2008) presents theoretical, conceptual, and practical arguments for using a capitals approach to inform governments of their progress towards sustainable development. The WGSSD's work is a 2005/2006 initiative negotiated by the Conference of European Statisticians within the UN's Economic Commission for Europe, and is scheduled for completion by end 2008. It can be seen as a milestone along at least a decade of programmed discussion (OECD 1998), where experts in national statistics and macroeconomics consider the wicked policy problem[1] of applying sustainable development indicators.

Similarly, the author has collaborated over the past decade with the Eurobodalla Shire Council on accounting design for sustainability governance. Collaborative arrangements have varied over time. They include: reporting the transaction costs and benefits to local authorities and the Australian Bureau of Statistics from experimental estimates of an Environment Protection Expenditure Account (Tegart 1999; Osborn 2002a; Osborn 2002b); conducting a case study linking the Council's information management to its 'Good Government – better living' mission (Osborn 2001); championing the Council's achievements in Triple Bottom Line reporting (Eurobodalla Shire Council 2003; Osborn et al 2004); and illustrating the boundary spanning necessary for an early adopter in environmental management accounting innovations (Osborn 2005). Present collaborative arrangements combine the Council's on-going advocacy for integrated planning and reporting within the local government system of New South Wales (Tegart 2007) with the

[1] "Australian Public Service Commission (2007), *Tackling Wicked Problems: A Public Policy Perspective*. Canberra. Commonwealth of Australia" identifies the characteristics of wicked policy problems.

author's doctoral research interests in communication design, social network analysis, and sustainability science.

Here, comparing two accounting designs for sustainability governance proceeds as follows. The next section describes feasibility studies with two Australian local authorities. Section 3 then discusses results in two ways:

- First, as a communication design that uses existing contexts and conditions, and adapts them to strengthen the communicational power of accounting messages for sustainability governance.

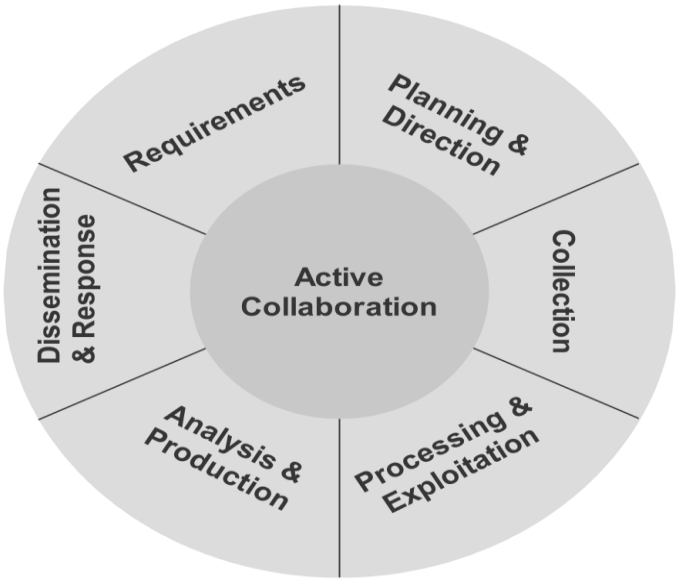
- Second, by comparing the Australian studies with the WGSSD's intention of also accounting for change in assets over time and space, and their draft framework for doing so.

2. Capitals-approach feasibility studies with Australian local authorities

Stallworth (1997) and the Department for International Development (1999) provide early examples of an unknown, but probably significant, number of projects in many countries that package learning materials for sub-national levels of sustainability governance around a capitals approach. Two recent Australian additions are identified here. The first was conducted during 2005, when the Campaspe Shire Council tested an integrated assessment of change in its community's human, produced, and natural capital stocks as a means for managing sustainability transition. The second began in 2008, with preliminary results reported here on assessing change in the Eurobodalla Shire Council's governance capital and social capital networks.

Each feasibility study can be considered as the first round in an intelligence cycle, or cycle of continuous learning. An intelligence cycle built from active collaboration among all stakeholders seems appropriate to the needs of sustainability governance, and contains six phases (Figure 1).

Figure 1: A Six Phase Intelligence Cycle



Adapted from FBI's Directorate of Intelligence

The studies envisage a cycle built on release of Population and Housing Census results for local government areas, thus setting the time interval and phasing for a round of intelligence production, dissemination and response, i.e. the 'requirements' and 'planning & direction' phases scheduled to take place prior to release of small area census data, with the other three phases after. Population & Housing Censuses in Australia are conducted at five-yearly intervals.

The method used in the two feasibility studies adapts the Social, Environmental, and Economic (SCENE) Model tested at city, provincial, and national levels of sustainability governance (Grosskurth & Rotmans 2005). Its key features are:

- Conducting an integrated assessment of change in a 'transition arena': a place located in physical, virtual, or institutional space where policy makers, policy takers, and scientists conduct experiments, envision futures, and build networks (Loorbach 2007).
- Collecting data through a nested structure:
    - Human, natural, and produced capital domains;
        - Stocks within each domain;
            - Quantitative, qualitative, functional, & spatial characteristics of each stock; and
                - Indicators reflecting stocks deemed critical to directing transition.
- Using Qualitative Systems Analysis as a decision-support tool within the transition arena to establish relationships between the stocks, and to construct action plans and policies (Grosskurth 2007).

The Australian feasibility studies modify the SCENE model in four ways to shift from independent assessments or accountings to those designed to contribute more directly to the horizontal and vertical policy integration necessary for sustainability governance.

First, functional characteristics of SCENE's three capital domains are aligned with international conventions as follows:

- human capital stocks are assigned 'producer' or 'consumer' functions; and
- natural and built capital stocks are assigned 'resource', 'sink', 'survival', or 'amenity' functions in concordance with SEEA-2003 definitions (United Nations et al, 2003:5).

Second, governance capital (formal institutions) and social capital (informal institutions) are added to extend SCENE's capital domains from three to five. The extension reflects ideas on the stocks constituting the intangible capital domain, and on that domain's significant contribution to wealth, as reported by the World Bank (2006:88).

Third, each of the five capital domains now within this adaptation of SCENE's nested structure is aligned with an international classification of statistics (UN Statistics Division undated; UNECE 1989) as follows:

- human capital ↔ Population & Housing Censuses;
- governance capital ↔ Classification of the Functions of Government;
- natural capital ↔ ECE Standard Classification of Land Use;
- social capital ↔ International Standard of Industry Classification; and

- produced capital ↔ Classification of Produced Assets.

Fourth, by drawing on secondary data from the small area statistics database (e.g. past Population & Housing Census, Agricultural Census, Manufacturing Census) instead of collecting primary data. The design thus provides stakeholders with immediate opportunities to consider change over time in those capital stocks held by individuals, or produced by society, or provided by nature.

2.1Assessing change in stocks of human, produced, and natural capital

Osborn and Mcfarlane (2006) provide context and further detail on the Campaspe study. They identify another adaptation to the original SCENE model, where one form of computer-aided decision-support for the transition arena – Interpretive Structural Modelling (Warfield 1977) – replaces another - Qualitative Systems Analysis (Grosskurth 2007). Irrespective of how dialogue within the transition arena is transformed into policy decisions for sustainability governance, the intention is for scientific experts to collaborate with policy makers and takers in co-producing usable knowledge (Clark 2003).

Other key features of the Campaspe study are identified here against phases in the intelligence cycle:

- Requirements Riparian to the River Murray, the Shire's economy depends on irrigated agriculture and tourism. The Population and Housing Census was identified as a source for human capital and produced capital indicators, and the Agricultural Census as a source for produced capital [2] and natural capital indicators.

- Planning & Direction The Campaspe Shire Council typifies many thousands of local authorities and other stakeholders at global scale that accept 'place' as the object to be sustained: Place is the context, sustainability is the goal, and service learning is the strategy (Zimmerman 2004). Learning how to best provide services from produced assets has always been a function of local authorities. The learning steps from managing performance of physical infrastructure within its own inventory to monitoring and managing performance of all human, produced, and natural capital stocks located within its jurisdiction seem relatively easy for a local authority, and its electorate. Particularly so when compared to a grassroots task of learning and accepting ideas on Hicksian income or Solow's constant capital rule.

- Collection Community profiles from the 1996 and 2001 Population and Housing Censuses were downloaded from the Australian Bureau of Statistics (ABS) Website. Colleagues from the Victorian Office of the ABS also provided Agricultural Census data on request.

- Processing and Exploitation 1996 and 2001 values for selected indicators were transferred from ABS data on to a spreadsheet. A primary function was assigned to each indicator. Column heads for assigning qualitative characteristics and an overall assessment were also entered. Spatial characteristics were ignored for a first round. The spreadsheets were emailed to the Council' senior management team for completing the integrated assessment in two steps. First, by assigning a qualitative score on a five-point scale (-2 to +2) to reflect their judgement as to the capacity of the stock to perform its assigned function according to international, national, or community

[2] Vineyards, orchards, and breeding stock are produced assets within the UN's classification, and a significant contributor to economies in the River Murray region.

standards. Second, by giving each indicator an overall assessment of increasing, or steady, or decreasing change during 1996-2001.

- Analysis & Production Indicators assessed by a senior management team within the Council as increasing during the 1996-2001 interval were presented as 'assets' in a balance sheet, while those assessed as steady or decreasing were presented as 'liabilities'.

- Dissemination & Response The senior management team limited distribution of the balance sheet to a selected group of some twelve persons, including middle management, operational staff, and an elected representative. They also drafted a series of some 24 statements responding to 'liability' indicators. The group then worked with a trained facilitator to create a relational hierarchy or mapping of relationships between the response statements, using Interpretive Structural Modelling (Warfield 1977) – a computer-aided decision support tool interacting with voting decisions by the group. A complete cycle testing the capitals approach used in the Campaspe study would then review the implementation of decisions made in response to the 1996-2001 assessment, prior to again identifying requirements to be met coincident with release of the 2006 Population and Housing Census at local community level.

2.2 Assessing change in stocks of governance and social capital

Many stocks within the natural capital and produced capital domains are fixed within a local community's place. Its stocks within the human capital domain are mobile, moving across a local government's boundary on temporary and permanent journeys. For example, around 40% of the Eurobodalla Shire's ratepayers are non-residents, making temporary journeys from their homes in the Australian Capital Territory and environs to their weekenders in the Shire. Permanent journeys by the Shire's human capital are reflected through average annual growth rates in its residential population of some 1.5 % to 1.9% over the last decade.

Much of the Shire's governance capital, however, consists of relationships between its Council with formal institutions located at considerable distance from its jurisdiction. For example, the Eurobodalla Shire Council participates in the Cities for Climate Protection (CCP) campaign established by the International Council for Local Environmental Initiatives (ICLEI): an organisation with global headquarters in Toronto and Australasian headquarters in Melbourne. The governance capital for the Shire's greenhouse actions also connects to Canberra through grant funding. The core of the Shire's social capital consists of relationships between informal institutions within its own boundaries, but also extends out into regional, national, and international networks (e.g. sporting affiliations, cultural activities, professional associations, service clubs).

The cost of collecting from organisations the primary data that is sufficiently robust to reflect such complexity with some accuracy, and do so consistently over the long term required for sustainability governance, seems beyond the capacity of most governments. Other tools, other collections, and other analytical methods are necessary.

Assessing Change in Governance Capital

Serdült et al (2005) are developing a social network analysis tool - the Actor-Process-Event-Scheme (APES) – where identifying organisations, and the events or messages that create or reflect the relationships

between them, occurs through content analysis of existing documents. Understanding and comparing policy networks is, to date, the primary application of the APES tool.

The intelligence cycle built from active collaboration between stakeholders is used again, this time describing a feasibility study on assessing change in governance capital stocks at a local community level.

- Requirements Consistent with its mission of 'Good Government – better living', demonstrating regional leadership is a key corporate goal for the Eurobodalla Shire Council. Its organisational culture has to manoeuvre between the uncertainty that always accompanies innovation with being accountable to its electorate and to central government. Innovations in integrated environmental and economic accounting (Tegart 1999, Eurobodalla Shire Council 2002), and in integrated planning and reporting (Tegart 2007), are necessary but insufficient contributions to implementing the Council's sustainability policy. A capacity to differentiate between human and social capital, and to assess and respond to change in the latter is part of the Council's intelligence requirements over the medium term.

- Planning & Direction The present feasibility study is being conducted on a 'best-intentions' basis built from a decade of past collaboration between the Council's senior management and the author. Further investment into greater understanding, and therefore management, of the Council's governance capital depends on known and unknown outcomes in the future. For example, during the balance of 2008 those known to impact on this study's future include electing a council, replacing the retiring general manager, and implementing integrated planning and reporting reforms developed by the State Government in collaboration with its local government sector.

- Collection Access to relevant documents is a pre-condition to analysing a policy network with the APES tool. Local governments in New South Wales are required to list in their annual reports those documents accessible by the public. Recent annual reports by the Eurobodalla Shire Council list some fifty such documents, including relatively large volumes[3]. Options were identified and tested, with selections for a first-round study made as follows:

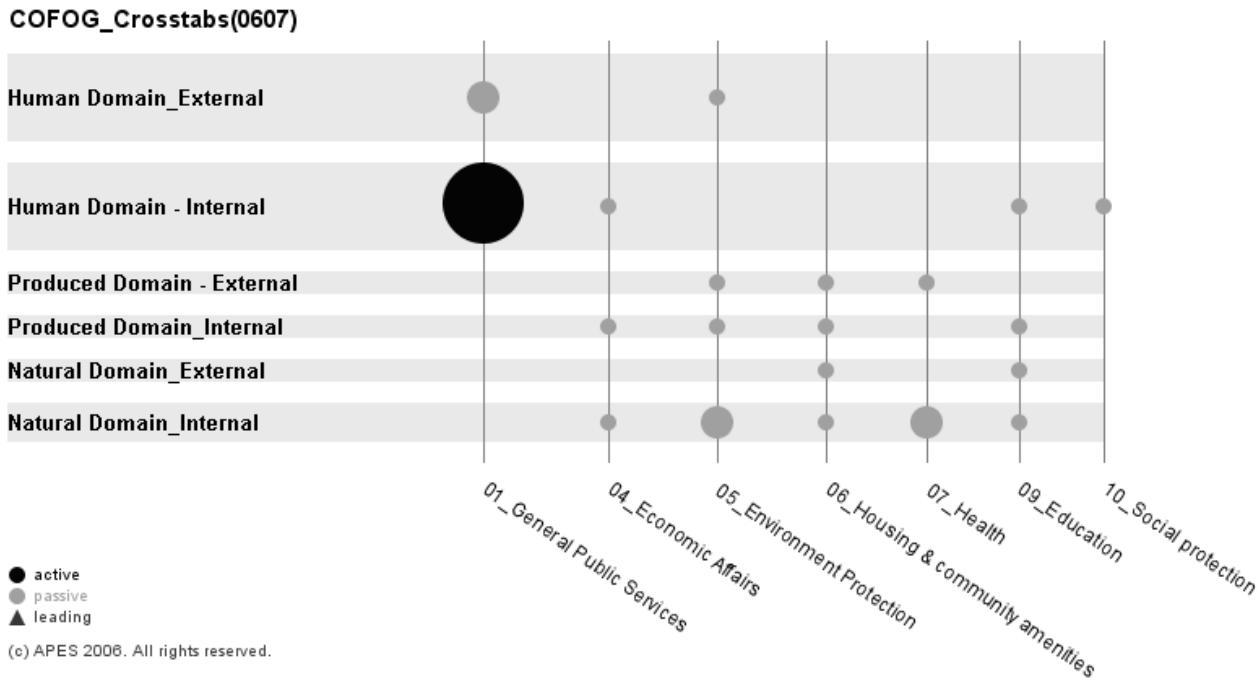
    - A 'Profile and purpose' section, and a 'Regional leadership' section, in an annual report provided the contents from which to identify the actor groups required for conducting an APES analysis of governance capital.
    - A 'How do we report our performance?' section in the same annual report provided the contents from which to identify the events (messages) creating relationships between actor groups.
    - The study assessed change over a five-year interval, using the Council's 2002/03 and 2006/07 Annual Reports.

- Processing and Exploitation Material for identifying elements in the Eurobodalla Shire Council's governance capital for 2002/03 ran to 38 pages, and similarly to 38 pages for 2006/07.

[3] The Council's 2006-2007 Annual Report contains some 420 pages, with its 2007-2012 Management Plan exceeding 200 pages.

- Analysis & Production Depending on year analysed, applying the APES method to collected material resulted in arrays containing between 180 and 330 actor-actor relationships derived from between 35 to 55 events. Figure 2 presents an aggregated version of data entry from the Council's 2006-07 Annual Report. Formal institutions of governance actors identified from collected material were sorted by domain and whether they are located within or outside the Council's jurisdiction. Events were sorted by function, using the major classes and sub-classes within the Classification of Functions of Government. The number of relationships formed at the interface between actor and event as aggregated within Figure 2 is reflected by circle size, with the Council's senior management team and elected body heavily engaged in reporting the organisation's performance across human, produced, and natural capital domains.

Figure 2: Illustrating the APES Method



Assessing change in governance capital over time is the primary purpose in the Eurobodalla feasibility study. Analysis through the APES method yields results able to be interpreted in a number of ways.

Table 1: Growth in formal institutions – Eurobodalla's Sustainability Policy Network

Capital Domain	Internal Groups (02/03)	Internal Groups (06/07)	Internal Change	External Groups (02/03)	External Groups (0607)	External Change
Human	10	5	-50%	8	12	50%
Produced	11	12	9%	10	13	30%
Natural	13	11	-15%	6	6	0%
All	**34**	**37**	**9%**	**24**	**31**	**29%**

Source: Eurobodalla Shire Council Annual Reports

An effective network is seen as one where approximately half of all nodes (actors) are connected (Valente & Fosados (2006). The maximum number of connections possible ($n^2 - n$) for the actor groups identified in Table 1 would be 2,862 in 2002/03 and 4, 556 in 2006/2007. The material analysed to date in this first round identified 180 (6%) of possible actor-actor relationships in 2002/03 and 322 (7%) in 2006/07.

Assessing Change in Social Capital

The World Bank sees social capital as formed by relationships between informal institutions, i.e. a form of capital stock where organisations and their relationships are some distance from the consultative and management committees (governance capital) established and used by the Eurobodalla Shire Council. The number of informal institutions operating in the local government area, and the events connecting them, is however beyond the network analysis possible with the APES tool. This study limits quantifying the community's social capital stock associated with sustainability governance to a more rudimentary analysis.

In 1998/99 the Eurobodalla Shire Council developed a comprehensive community consultation database to survey general views on service provision, and to seek comments upon a Rural Local Environment Plan. The 1998/99 database of community groups and industry representatives contains some 700 entries. Around 2003/2004 the Council invited community interest groups to contribute entries to a Community Services Directory, with some 550 local organisations responding to that invitation. The two databases are not directly comparable over time, given substantial differences in reasons for, and modes of, establishment. Nevertheless, the limited analysis still yields some understanding as to the dimensions of a community's social capital that is directed to its sustainability.

Two sort variables were allocated to each entry in the two sources of data. One derived from International Standard of Industry Classification (ISIC), based on the actor group's principal activity. Another derived from judging whether an actor group's primary purpose is directed towards human, produced or natural capital stocks. Limiting analysis to the three ISIC classes that dominate the databases is one way to improve comparability. Results are shown in Table 2, and signal the complexity and strength of community life within a place providing permanent residence to only 35, 000 people.

Table 2: Cross-Tabulation of Community Interest Groups: ISIC Activities Class x Capital Domain

ISIC Activities Class	Human	Produced	Natural	ALL
1998-99				
Q_Human health & social work	62	1		**63**
R_Arts, entertainment & recreation	18			**18**
S_Other service activities	255	39	67	**361**
ALL	**335**	**40**	**67**	**442**
2003-04				
Q_Human health & social work	71	8		**79**
R_Arts, entertainment & recreation	75	35	2	**112**
S_Other service activities	61	29	55	**145**
ALL	**207**	**72**	**57**	**336**

Source: Eurobodalla Shire Council

2.3 Summary

Two feasibility studies on accounting design are reported in this section. Both use existing conditions faced by Australian local authorities as they direct transition within their communities towards a state of sustainability, and consider adapting the SEEA-2003 definition of a capital approach to do so: *Sustainable development is development that ensures non-declining per capita national wealth by replacing or conserving the sources of that wealth; that is its stocks of produced, human, social, and natural capital* (United Nations et al : 4).

The feasibility study with the Campaspe Shire Council of Victoria on using existing conditions to assess change in three of a local community's capital stocks was completed in 2005. The feasibility study with the Eurobodalla Shire Council of New South Wales on using existing conditions to assess change in two other capital stocks of a local community is ongoing at the time of writing. Both demonstrate that existing contexts and conditions within which social and environmental accounting messages are transmitted can be modified in a number of ways. Those identified here include:

- the diversity of capitals approaches favoured at many levels of sustainability governance can be given standing by stakeholders adopting the SEEA-2003 definition of sustainable development;
- the SCENE model of integrated assessment already tested at multiple levels of sustainability governance can be given wider application by aligning its quantity, quality, function and location characteristics of capital stocks with standard classifications already adopted by the international community;
- the World Bank's differentiation between governance capital and social capital in its comparison of wealth held by nations can also apply at local community scale;
- the APES tool of social network analysis seem to offer considerable efficiency and effectiveness advantages over collecting primary data to measure governance capital; and
- adapting such design features provides immediate opportunities for an integrated assessment of change in assets over time and space using aggregations possible in statistical geography, and thus through a hierarchy of decision-making levels.

The communication design tested through the two feasibility studies seems then to offer considerable promise in strengthening the communicational power of past messages that often fail to encourage adoption of environmental, social or sustainability accounting innovations by private and public sector stakeholders.

3. Discussion

3.1 Issues identified through the feasibility studies

Time and, in Australia, distance limits significantly the interpersonal communication necessary for the learning-by-doing as stakeholders and scholars grapple with the wicked policy problem of sustainable development. The shifting sands of electoral cycles every three or four years, their impact on restructuring public administration, and the gains or losses of key individuals, impact at all levels of public administration. Their consequences often present stakeholders with multiple and conflicting ideas on tracking progress to, say, sustainable development; and certainly limited the interest of senior management in progressing with the Campaspe feasibility study.

Testing the APES tool through the Eurobodalla study reinforces the claim by its developers that it provides a relatively simple, efficient and effective means of illustrating and analysing a policy network. Once the difficult choice on selecting material for analysis had been made from the considerable volume of documentation available, then results for one year were produced within a few hours. Investing additional time on analysing more material could be expected to yield greater transparency with respect to the Eurobodalla Shire's internal governance capital.

Irrespective of whether the source material is from a national government, a state government, or a local government, it seems likely however that none will acknowledge fully the engagement and contribution of another. A relatively complete assessment of sustainability governance capital would almost certainly have to collect material from multiple sources rather than one administration. Even so, analysing secondary data from policy documents seems a process replicable over the time frame of sustainability governance, especially if it scheduled into a five or ten year cycle.

With its 35, 000 resident population establishing relationships manifest through h undreds of interest groups active in forming and using human, produced, or natural capital, the Eurobodalla case study suggests any social network analysis of social capital is beyond the design of the APES tool. Other social network analysis tools designed for a larger number of actors have been applied to sustainability governance at local community level (e.g. Krebs V & Holley J 2002-2006), and offer opportunities for measuring and managing the densities of social capital networks.

3.2 Issues identified through comparing two accounting designs

The WGSSD's draft proposal of 2008 uses macroeconomic theories and concepts to argue for harmonising the present diversity in sustainable development indicators. A key feature of its draft proposal is to suggest that accounting and information systems be modified significantly. The purpose in doing so is to enable public administrations at all levels and in all countries to track progress in the distribution of assets over time within their jurisdictions.

The WGSSD's draft proposal sees adoption of a universal set of fourteen headline indicators as necessary for achieving this purpose. Statistical collections by the International Monetary Fund (IMF) point to the magnitude of a task with such ambitions. Some 90 national governments reporting to the IMF identify over 1.1 million provincial and local government institutions operating at sub-national level (IMF 1999), with those reporting such data somewhat less than half of all national governments.

Even if the WGSSD continues to propose such a fundamental change in communication design for sustainability governance, the feasibility studies reported here suggest that it is not necessary. At a time when evidence-based policy is in vogue then practitioners and commentators on sustainability governance have to confront wicked policy problems by searching for shapes and structures. Aligning international classifications with nested data structures that engage stakeholders, and constructing network arrays from secondary data, seem to offer new opportunities for doing so.

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