GUEST RESEARCH PROFESSOR

PROFESSOR DR OCKIE BOSCH B.SC. M.SC. D.SC.

Current Positions Research Professor, Malik Management, St Gallen, Switzerland
Distinguished Guest Professor, Systems Design and Management, Keio University, Japan
Editor-in-Chief, Systems Journal, MDPI

Address 45 Wellington Street, Longford, Tasmania 7301, AUSTRALIA

Telephone +61 (0)417 076 122 (Mobile)

Email ockie.bosch@mszg.ch

Nationality New Zealand Citizen (Born South Africa); Australian Permanent Residence

Marital Status Married for 48 years to Annerine nee Geringer (3 children; 7 grandchildren)

Languages English - fluent
Afrikaans - fluent
Dutch - conversational
German - conversational

Qualifications 1974 Doctor of Science
Integrated Environmental Modelling & Quantitative Ecology
University of the North West, South Africa.

1972 M.Sc. (cum laude)
Quantitative Ecology and Soil Science
Potchefstroom University for CHE, South Africa.

1967 B.Sc. (Distinction one), PU for CHE, South Africa.

Informal Training

- Management of interdisciplinary projects
- Conflict resolution and facilitation
- Staff evaluation procedures
- People management (various)
- Organisational Management (London Business. School)
- Bayesian Belief Network modelling
- Systems Approach to Business Plan Development
- Strategic Planning (Haines)
- Senior Management Development (Understanding topical University issues; Taking appropriate action within respective organisational units) (16 courses 2001 -2010)
- Sensimod & Ecopolicy – Malik Institute

1. HIGHLIGHTS HONOURS/DISTINCTIONS/MEMBERSHIP OF SOCIETIES, COMMITTEES DEMONSTRATING NATIONAL AND INTERNATIONAL REPUTATION:

1.1 Current and Recent

- Invited **keynote speaker** at:
  - Invited Keynote speaker (All costs paid) at IASCYS conference, “”-24 October 2018, Beijing, China.
  - Opening keynote speaker at International Conference on Leadership for Sustainability, **India** 23-25 July 2016
  - Invited to run a three-day pre-conference course on Systems Thinking for Everyone at International Conference on Leadership for Sustainabilty, **India** 20 - 22 July 2016
  - Keynote Speaker (Banquet) at ISSS 2016 conference in Bolder **Colorado, USA** (24 – 30 July 2016)
  - Indo-Global Healthcare Summit & Expo 2015. Hyderabad, **India** from July 23 to 26, 2015;
  - 5th Annual International Conference on Business Strategy and Asian Economic Transformation (BizStrategy). **Singapore** from 27-28 July 2015;
  - 3rd Business Systems Laboratory International Symposium "Advances in Business Management. Towards Systemic Approach", 21-23 January 2015, **Perugia, Italy**.
  - Opening session keynote speaker at International Systems Conference of the Hellenic Society, **Athens, Greece,** May 2014
  - Business Systems Laboratory 2nd International Symposium: Systems Thinking for a Sustainable Economy, **Rome, Italy** January 2014
  - Opening session of the 57th ISSS conference**, Haiphong, Vietnam** July 2013
  - International Symposium: The Economic Crisis – Time for a Paradigm shift towards a Systems Approach Jan 23-24, 2013, **Valencia, Spain**. (**Best Paper award**)
  - Invited Keynote Speaker 2nd International Symposium - SYSTEMS THINKING FOR A SUSTAINABLE ECONOMY: Advancements in Economic and Managerial Theory and Practice, 23-24 January 2014, **Rome, Italy**
  - International Forum for the Environment (Shanghai) Chinese Academy of Science in collaboration with Scope. MAB and UNESCO (Speaker and panellist), 28 – 30 November 2011, **China**
  - International Conference of Economics, **Buenos Aires, Argentina**. 7 November 2011
  - International Symposium on Systems Science and Systems Engineering, February 25, 2011 - **Keio University, Japan**
  - Action Learning & Action Research Assoc, (ALARA) World Conference, **Melbourne, Australia** 7-9 Sep 2010.
  - 2010 World Confer. of International Society for the Systems Sciences, **Waterloo, Canada**, 17-21 July 2010.

- International Biosphere Managers Conference (part of Global Eco Conference, **Noosa, Australia** (24 -29 October 2010).
- United Nations World Conference on the Decade of Education in Sustainable Development, **Bonn, Germany**, March 2008.
- World Conference on Sustainable Heritage Development, July 2007, **Siem Reap, Cambodia**

- Appointed on invitation as **Editor-in-Chief** of *Systems* Journal (1 Jan 2016 - current)
- Appointed as **Distinguished Guest Professor**, Keio University, Japan. (Postgraduate training and corporate courses ongoing (2009,2010,2011,2012,2013,2014,2015, 2016 and 2017) (2015 -)
- **President Elect** of the International Society for the Systems Sciences (ISSS) (2015/16)
- **President** of the International Society for the Systems Sciences (ISSS) (2016/17)
- **Past President** ISSS Lifelong
- **Research Professor, Malik International**, Saint Gallen, Switzerland (June 2016 – present)
- Academician of the prestigious **International Academy for Cybernetics and System Sciences** – one of only 64 invited worldwide so far to become members;
- **Vice-President** of the International Academy for Cybernetics and Systems Sciences (1 Jan 2016 – 30 Jan 2020)
- Member (2009 – 2016) and **Chair** (2016 - present) of the Board of Directors of the ISSS
- Member of the **Scientific Board** of the Business Systems Laboratory, Italy
- **Honorary Member** of the Board of the BSLab. Italy – Life-long;
- **Honorary Professor** in Systems Design and Complexity Management, University of Adelaide, Australia April 2015 – May 2018)
- **Editorial Review Board** - Systems Research and Behavioral Science Journal (2015 - present)
- **Guest Editor** of Journal - Systems (International). Edition title: Systems Education for a Sustainable Planet (2014-2015)
- **Certificate of Merit** from the Vietnamese Government for Contributions to Integrated Governance and diffusing systems thinking in Vietnamese society;
- **Award** from Chinese Government on their National Day for Foreigner with highest scientific impact on China's National Day (Sep 2014)
- **Vice President ISSS** (International Society for the Systems Sciences - ISSS) Systems Education and Communication (2009 – 2015).
- **Chair** International Committee for Systems Education IFSR (International Federation of Systems Research - IFSR) 2008 – 2016)
- **Adjunct Professor**, Flinders University (2010 – 2016)
- **Specialist Professor** Doctoral Program University of Patagonia, Argentina (2010 – present)
- **Vice-President ISSS** Conferences and Membership (2007 -2008)
- **Australian Council for the Environment**, Deans and Directors (2008 – 2011)
- **Board member of Noosa Biosphere** (Education and Research and development sector) (2007 – 2011)
- **Academic Boar**d The University of Queensland (2000 – 2011)
- **Chair Faculty of NRAVS Marketing** Committee (2006 – 2009)
- **Chair of APSRU Board** - Agricultural Production Systems Research Unit Board (2005 – 2006)
- **APSRU management committee** (with responsibility to improve linking science and people) (2003 – 2005)

- **Standing Committee of the Academic Board**, The University of Queensland (2004 – 2006)
- **Management Board CRC** Tropical Savannas (2003 – 2007)
- **Associate Editor** of the Australian Rangeland Journal (1997- 2004)
- **Coordinating Committee (UNESCO/MAB Vietnam)** for Establishing Biosphere Reserves as Learning Laboratories for Sustainable Development (2006 – present)
- Provision of **corporate training** (on invitation from UNESCO and IUFRO) in systems thinking and modeling in Australia (2005, 2006; 2007; 2009, 2010), Vietnam (2006; 2007; 2008), New Zealand (2006), China (2005; 2007; 2009), France (2008), Philippines (2007), Cambodia (2009; 2010) and Chile (2004); Japan (2017; 2018) - **ongoing.**
- Invitation by **Turkish government** (fully paid consultancy) to run workshops on Participatory Decision Support System development. (February 2009).
- Member of **CEC in IUCN**
- Invited by **International Federation for Systems Research (IFSR)** to 2008 Fuschl conversation in Austria (restricted to 30 invitees from around the world)
- Invited as **facilitator of 2010 IFSR Pernegg Conversation** for development of curricula for Systems Education (Introductory and Advanced courses)
- Visiting Professor and in 2015 appointed as **Distinguished Guest Professor at Keio University, Japan** - Postgraduate Teaching Systems Thinking and Design; Bayesian Network Modeling Sept/Oct 2011; Aug/Sep 2012; March 2013; April 2014; June 2015; October 2016; February 2017; Oct 2017; **Feb 2018; Oct 2018; Feb 2019; Feb/Mar 2020 - ongoing**
- Member of Executive Board of Centre for Native Floriculture (with special responsibility to oversee research on consumer needs as an input to marketing and selection of research material).
- **Successful Research Grants[1] since 1995:**
  - Foundation of Research Science and Technology 1995 - NZ$ 4.1m,
  - FRST 2000 - NZ$5.4m;
  - NZ Rural Futures Trust $120,000
  - CRC Tropical Savannas ($510,000)
  - ARC Linkage ($120,000);
  - 2001 CRC Coastal Zone ($30,000);
  - 2007 – CRC Beef ($1.3m);
  - 2008 – CRC Beef $114,000 (PhD Scholarship)
  - 2008 – AusAid ($180,000) Vietnam;
  - 2009 – 3 PhD Scholarships, Vietnam Government ($300,000+)
  - 2009 – AusAid ($154,000) Cambodia;
  - 2010 – AusAid ($126,000) China.
  - 2013 – Haiphong Government ($50,000)
  - 2013 – Bill Gates Foundation ($100,000)
  - 2014 – SA Government ($50,000)
  - 2015 – SA Health ($30,000): Various pending outcomes
  - 2015 – Keio University, Japan - present ($12,000 per annum honorarium fees,)
  - 2016 – 2017 Malik International ($71,500 per annum)
- Above, plus **PhD completions and publications** resulted in a Q-Index above the average of all Level E appointments at The University of Queensland (UQ) (despite the fact that research was not part of the position description of a Head of School from 2001 -2011)
- **Chair of organising committee of 53rd ISSS 2009 conference** held on the St Lucia campus (12-17 July 2009).
- **Chair** of the ISSS Special Integration Group on **Designing Systems Education** 2008 – 2009

[1] Despite own research not expected in position description of Head of School

- **Invited by UNESCO** (all costs paid) to:
  - do **presentations on the use of integration and systems approaches** to develop Biosphere Reserves as learning laboratories for sustainability
  - **discuss and systemically identify small-medium-large projects** that would fit this model/approach in the Angkor-Tonle Sap-Siam reap ecosystem complex in Cambodia, and to
  - meet with the **Minister of Tourism and Australian Ambassador** to discuss Cambodia/School of Integrative Systems co-operation and sign a Memorandum of Agreement to collaborate in capacity building (systems approaches; social science methodologies, communication; participatory planning) and research (complex issues), 2008 - led to current ELLab being developed in collaboration with various Ministries, organisations and community groups.
- **Agreements** signed with Hai Phong Province and Hanoi National University of Education (led to Hai Phong Province requesting the development of a series of ELLabs for governing the whole Province with an integrated systems approach to overcome lack of cross-sectoral collaboration and communication – a "World First")
- **Invited by the Chinese Government** (all costs paid) to explore socio-economic development of communities in and around natural parks, biosphere reserves and tourism growth areas (Oct. 2007). (Led to follow-up visit, signing of an agreement and making available CNY 3M for first year to initiate an ELLab for Balancing Food Production and Biodiversity goals).
- **Nominated for award as UQ Champion in International Relationships and Networking.**
- Received Dean's **award for teaching and Learning** 2014 (Systems Thinking for Complexity Management course, University of Adelaide)
- **Guest Editor**, Systems 2013-2014
- **Editorial Board** Systems Research and Behavioral Science Journal, UK
- **Chair as President of ISSS** 2017 world conference organising committee in Vienna, Austria.

1.2 Past

- **Editor** Journal Grassland Society of Southern Africa (1983 -1986)
- **Vice President** (1986) and **President** (1987) Grassland Society of Southern Africa
- International evaluation by S.A. Foundation of Research and Development for University staff: Classification: **Recognised international research leader** (1993)
- **Chair of Senate Committee of Potchefstroom University** for Integrated Environmental Research and Education (1990-1993)
- Appointed on **steering committee for Water Research Commission**, South Africa (1991-1993); grassland biome research programme, CSIR (1985-1993); Department of Agriculture - Rangeland Monitoring (1990-1993)
- **Chair of Arid Zone Forum** of the CSIR Foundation of Research and Development in South Africa (1991-1993)
- **Board Member** - Institute for Reclamation Ecology (SA) (1985-93)
- **Quinney Visiting Scientist Award** (One year visiting scientist all costs and salary paid), Utah State University, Logan, USA – (1991)
- Invited as **Chair of International Rangeland Symposium**, Pretoria, May (1991)
- **Invited speaker at International Congress on Decision Support Systems Applications**, American Society for Agricultural Engineering, Spokane (1993)

- **Invited speaker at:**
  - International Rangeland Congress, Salt Lake City (1995)- keynote
  - International Symposium on Desertified Grasslands, Linnean Society of London (1991) (Bosch & Theunissen, 1992) - guest
  - representing Africa at International Conference on Global Resource Monitoring and Assessments (Venice, Oct. 1989 — Bosch 1990)
  - WRRC40 meeting in Logan Utah, USA (October 1991)
  - NZ Grassland Society Conference, Oamaru (October 1996) -keynote
  - NZ Ecological Society conference, Blenheim (July 1999)
  - International Symposium on Rangeland challenges in the 1990's (CSIR, Pretoria, May 1991 — Bosch & Gauch, 1991) - keynote
- Invited by Landcare Research, NZ to run workshop on Integrated System for Plant Dynamics (November 1992)
- Invited on video-taped international panel discussion (representing Africa) during the First International Decision Support System Conference, **College, Texas A&M** (April 1991) (Bosch et al 1992; Bosch & Booysen 1992)
- Moderator and reporter of workshop session on barriers in science communication — International Soil Conservation Conference, **West Lafayette, Indiana** (May 1999)
- Appointed by FRD on South African University Development Programme Expert Task Group (1992)
- Appointed by FRD, South Africa on **committee for post graduate bursaries** (Life and Environmental Sciences (1990-1993)
- Member of the **Council of the Faculty of Science**, Potchefstroom University (1983-1993)
- Member of **University Sena**te, Potchefstroom University (1986-1993)
- Member of **Council of Faculty of Science**, University of South Africa (1986-1993)
- Member of Senate, University of South Africa, Pretoria (1986-1993)
- Invited author:
  - Chapter for Handbook of vegetation science (Bosch and Tainton, 1988),
  - Special prestige edition of Agricultural Systems and Information Technology, Australia (Bosch and Booysen, 1992);
  - Veld Management in South Africa (Bosch, 1999, and Hardy, Hurt and Bosch 1999); Desertified Grasslands — Their biology and management (Bosch and Theunissen, 1992);
- Honorary Professor, Lincoln University, New Zealand (1997- present)
- Honorary Fellow, Massey University, New Zealand; Co-supervisor of doctoral candidate WJ Allen. (1998-2001)
- Extra-ordinary Professor, Potchefstroom University, South Africa (1993-1996)
- Invited by Department of Agriculture, Western Australia to run a series of workshops on development of long term monitoring for state of the environment reporting (Nov. 1996)
- Invited by University of Pretoria to run a five-day workshop on the Integrated Systems for Knowledge Management package for application in conservation management in South Africa (September 1998)
- Invited on a two-month consultancy for Queensland Department of Primary Industries on application of Integrated Systems for Knowledge Management in pest control programme; conducting data analyses of long term monitoring data in Central-western Queensland using multi-variate statistics (led to a publication Phelps & Bosch, 2002); and review of modelling activities in climate programme (May to June 1998)
- Invited speaker, representing New Zealand at International workshop on monitoring, IRC, Townsville (July 1999)
- Invited by University of Tasmania on Visiting Scientist Program 2000, re development of a community-based resource monitoring programme

2. CAREER HIGHLIGHTS

2.1 Integration Leadership- Managing Science and Research to make a difference

Professor Bosch has a long history during which he was provided with excellent opportunities to develop his leadership skills in integration, management of scientific research, how to co-ordinate multi-disciplinary research activities and to find ways to maximise the impact of his research to all that could potentially benefit from it.

For example, with his appointment as associate professor in the Bureau of Development Studies of the Potchefstroom University in 1983, he came into the challenging position to develop an approach to integrate theory and practice. In order to serve communities effectively, **he developed a comprehensive research and development program for the Bureau, by the construction of question orientated models (through industry dialogue) and using these as "research directors".** Projects were assigned to students in different departments of the university. Professor Bosch's main role was to co-ordinate and supervise these studies, to help with technology transfer (e.g. through consultancies), and to ensure continued funding from the industry. This system also helped funders of research to develop an appreciation of the meaningfulness of research projects - ensuring positive outcomes of funding applications. The Bureau was fully self-funded within one year from its formation.

In October 1985 he was appointed as Professor and Head of the Department of Plant Sciences, and he integrated the Bureau into the School. Due to his experience in multi-disciplinary programmes and realisation of the fact that complex and comprehensive ecological problems can only be solved with the inputs of researchers from various disciplines, he made it one of the main objectives of the further development of the department to integrate the various sub-disciplines in Plant Sciences with disciplines in other parts of the University (Animal and Biological Sciences, Economics, Social sciences, Geography and Planning). This integration served as a basis for the development of a strong multi-disciplinary research culture at his University.

This holistic approach towards environmental problems became even further possible with the amalgamation of the departments of Plant and Soil Sciences of which Professor Bosch was the main architect. He developed a fully integrated approach in the research and educational programs based on **industry needs** in environmental planning and management.

i) Making science work for the people; developing practical solutions:

Professor Bosch led the Tussock Grassland Research Programme in New Zealand (1994-2000). Initially the funding for research in the tussock grasslands was spread amongst various organisations in New Zealand, all competing for the same source of funds. This led to an ineffective research effort where the activities of the different organisations were siloed, uncoordinated, and limited by small budgets. Professor Bosch developed a comprehensive new programme, which not only integrated the various disciplines of fundamental and production ecology, soil science, social science, extension and communication, action research, and economics, but also different organisations, community groups, private consultants, and local government agencies who previously competed with each other.

The research objectives were defined through intensive community dialogue, which not only led to all these organisations taking ownership of the research programme, but also ensured its success to attract multiple-year funding from the Foundation of Research Science and Technology. Professor Bosch received a merit in 1999 for his performance to bring scientists from different disciplines and organisations together into one program integrating:

- ***Biological understanding (***biodiversity assets and function in managed/human populated landscapes; critical attributes of habitat quality, landscape connectivity and functional integrity for restoration and management of iconic and keystone biota along the rural-urban continuum; and how biodiversity is affected by natural and human-induced disturbances);
- ***Social and cultural understanding*** (Processes and mechanisms that are most useful for helping the different groups involved (including Maori) to use tools, policy mixes, management strategies within a co-ordinated approach to achieve biodiversity outcomes); and
- ***Bringing it all together (***How the **biological/ecological understanding** and social understanding can be used to enhance biodiversity in a **culturally/socially acceptable** way and **meet financial and production goals).**

The Integrated Systems for Knowledge Management approach, developed by Professor Bosch and one of his PhD students was used as a basis for conducting the research, and to link the research more closely with management and policy (**ISKM** - Bosch *et al*. 1996; Allen *et al* 1996) – see next point.

ii) Community-based research; participatory approaches:

Achieving any objective (from land use to the efficient management of an organisation) depends on high quality information and improved use of the information within a collaborative decision-making process. For this, Professor Bosch and his research team developed the **generic *Integrated Systems for Knowledge Management* framework** for guiding the actions for managing real world problem situations. It builds on principles of experiential learning and systems thinking, and is applicable to developing the knowledge and actions needed to change real situations constructively. The ISKM framework consists of simple and familiar processes and was designed around the five basic actions of any management programme — identification of problem and setting a management target; searching for information on how to achieve the target (taking into account the environmental, social and economic factors); implementing the best management practice available; evaluating the outcome; and adapting the management if required.

To encourage people to carry-out these steps in addressing any issue that requires management (especially those that are complex and we don't have all the answers for at the beginning) the ISKM framework helps to

- develop appropriate processes for community participation
- bring people together to share their local knowledge (e.g. from experience and monitoring), and science knowledge (e.g. from research and scenario testing) and jointly develop best management practices and/or action plans that are socially acceptable, and economically viable;
- include monitoring in these action plans to assess and interpret the outcomes of management actions (Professor Bosch developed a user-friendly Management Decision Support System with end users for this purpose: Resource and Environmental Decision and Interpretation Systems (REDIS) (Bosch & Gibson, 1997)
- capture the best management practices and other information within a management information system to potentially benefit all those that did not have the opportunity to be directly involved
- develop feedback loops and processes to overcome barriers between science and end-users to maximise the benefits from monitoring and evaluation and hence develop a collaborative learning/self-improving environment.

iii) Knowledge Building and Management:

After moving to Queensland, Professor Bosch had an active research role in the CRC Tropical Savannah Management as Project leader of the Participatory Knowledge Building project – in developing an understanding of the importance of concepts of knowledge creation, knowledge management, and knowledge building in environmental management, community development and capacity building. He and his team received much acknowledgement for their research by funders who increasingly were using new criteria for funding of research (e.g. knowledge versus data and information; commercialisation of research; importance of direct evidence of community benefits). He was requested to integrate his team's research into every project in the CRC portfolio and to put special emphasis on the participatory development of evolving information systems as information dissemination and collaborative learning tools. Of particular importance was also the development of processes and mechanisms to link science with management (Bosch et al 2003).

2.2 Creating Platforms for Collaboration in Research

i) Within the School of Integrative Systems, University of Queensland.

The School has been formed as a purposeful amalgam of disciplines (natural resources and environment, social science and community development and Economics and Business systems). Professor Bosch deviated from the previous outcome area structure in the School because very few staff members had ownership of this concept. Various 'natural groupings' or fields of activity exist in the School, which were already in themselves integration areas, rather than single disciplines. He saw these different areas in the School becoming gradually integrated as staff were developing an appreciation and taking ownership

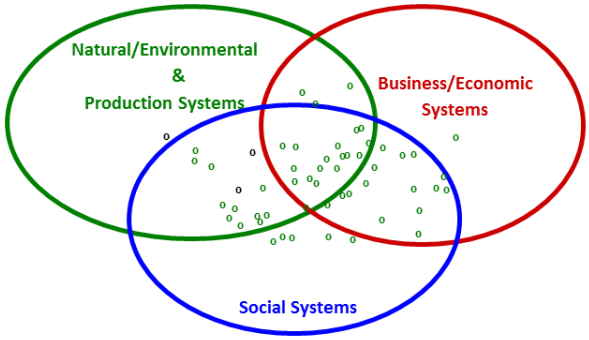


Diagram illustrating the integrated nature of SIS research projects from 2001 – 2007 (Position of research projects in different intersections of main management focus areas)

of/embracing the uniqueness of the School. The main fields of activity remained in the School, but the relative emphasis that they were given has continued to decline as they were increasingly overlapping with each other. Managers for the three main integrated areas of the school were responsible for performance appraisals of staff in their area, and providing direction, especially on how to contribute to a higher level of integration for dealing with big picture complex problems in the industry and communities. The main achievement of his approach was a greater ownership of the processes that determine the systems philosophy, core business and directions for the School. Committee members represented different integration areas in the School and used their leadership roles to obtain feedback and ensure all staff members became involved in planning and implementation of strategic directions.

Evidence of the successes of his management includes:

Collaboration between disciplines: Thirty-six percent of the School's research projects carried out from 2001 to 2008 brought together expertise from the social, environmental, production, and economic systems. Eighty five percent of all research projects in the social, community development and economic/business systems were integrated with each other or with the natural and production systems, while only 8 of the projects have been more focused on specific disciplines and fields.

Nature of refereed journal articles - The nature of the articles published by staff serves as an indicator of the degree of collaboration and multi-disciplinary nature of the School. Professor Bosch brought into the School the concept of **integrating research outcomes rather than focusing on integrating activities**/projects to enhance integration in research. Forums were held during which the outcomes of different projects were integrated to achieve bigger picture goals. The forums were also used to test new research ideas, to brainstorm the development of proposal frameworks and methodologies and to develop multi-authored conceptual papers by integrating the outcomes from various projects across the School. An example of such a multi-authored conceptual paper on Systems Thinking has been submitted on invitation to a special addition of the Journal of Systems Research and Behavioral Sciences, which involved four research groups in the School to integrate methodologies, results and lessons learnt in Cambodia (rodent control, social conditions and food safety), the Philippines (small scale forest farming, economics and livelihood of people), northern Queensland (mismatch between the goals and targets of regional planners and landholders) and weed management in New Zealand (Bosch et al. 2007). This publication is an example of the earlier ***'convergence'*** of different project outcomes and ***'emergence'*** of new and innovative concepts adding to the theory of participatory systems analysis.

Almost all refereed publications in the School were multi-authored and cut across two or more fields. These fields were often not restricted to those within the School, as various examples occur of collaboration with researchers from other Faculties (mainly Business, Science and Social and Behavioural Sciences) and the industry.

ii) Forming platforms for collaboration and integration across the Faculty, University and beyond

The demand for systems approaches in research and development is continuing to grow as land managers, planners, community developers, conservation managers, industries and governments struggle to cope with the complexities of balancing the factors that will ensure profitable, environmentally friendly and socially acceptable management practices. Such a systems approach builds on the knowledge gained from different disciplines and research approaches.

A major activity that is led by Professor Bosch has been created by

Professor Bosch's passionate and energetic international leadership in the creation of systems platforms for collaboration in research is mainly due to his deep understanding of integrative systems. His many publications, conference papers and invitations as a keynote speaker are evidence of his strong focus and passion to make systems sciences relevant

an invitation from UNESCO/MAB to **establish Biosphere Reserves as 'Evolutionary Learning Laboratories for Sustainability' (ongoing).** Sustainable development now occupies centre-stage in global efforts to understand and guide processes of societal change at local, national and international levels. The more than 560 Biosphere Reserves in more than 120 countries can be platforms for policies and practices that facilitate:

i. economic growth of local communities;
ii. conservation and sustainable use of biodiversity;
iii. community resilience; and
iv. the emergence of knowledge-based management arrangements at local, provincial and national levels.

Biosphere Reserves were seen by UNESCO as potential learning laboratories for sustainable development agendas. The UN Decade of Education for Sustainable Development (UNDESD; 2005-2014) presented a clear opportunity to position the World Network of Biosphere Reserves within such a worldwide niche for the benefit of sustainable development learning and practice of present and future generations.

This initiative focusing on sustainable development has been extended into an even larger undertaking under his leadership, which involved the establishment of ELLabs for the management of **all types of complex issues**. The concept of Evolutionary Learning Laboratories includes forming partnerships with major stakeholders, involving them in the development of a comprehensive model of the system under consideration and using the model to identify possible systemic interventions and leverage points in the system that could help to achieve a sustainable system or solving a complex problem – that is, using the descriptive model for **creating a platform for collaboration and integration** in research within and across Universities (national and international). The model also provides all stakeholders (and disciplines) the opportunity to see how their own interests are interacting with all the other sectors involved (e.g. social and livelihood issues interacting with tourism; agricultural development and tourism interacting/affecting conservation of biodiversity; etc.)

The identified leverage points and systemic interventions directly determine the nature of the capacity building and research projects that need to be carried out in managing the complex issue (or Biosphere) under consideration.

The systems model (and identified systemic interventions/leverage points) serves as **a platform for collaboration** and is used to actively promote involvement of relevant Centres, Faculties, Universities, research organisations, government agencies, industry and funding bodies such as the Bill & Melinda Gates Foundation, Asia Development Bank, ACIAR, IUCN, AusAid, UNESCO/MAB and country donors.

The ELLab work is continuing and Prof Bosch is still actively involved in various countries around the world in using the approach to help finding solutions to complex problems. He is carrying out this work in collaboration with Malik International in Switzerland.

The most important conceptual issue today in the development and management of our resources and businesses is that our society and economy have to craft innovative ways of development within increasing physical limits.

Professor Bosch has used Systems approaches and integration skills and tools as useful mechanisms to develop a number of University-wide, cross-Faculty flagship programs (educational platforms) that have become unique to the University of Queensland at the time – integrated multi-disciplinary programs that focus on critical and complex issues of our time and which are developing into major national and international reference points for potential students worldwide. Professor Bosch's own area of expertise, and deep understanding of the interactions between the biophysical world, people dimensions, business, and economics and the important role that factors such as politics and culture play in these interactions, contributes significantly to the realisation of his ambitious but achievable vision.

iii) Formation of the Alliance for Systems Design and Complexity Management

The most important conceptual issue today in the development and management of our resources and businesses is that ***our society and economy have to craft innovative ways of development within increasing physical limits***, in terms of both source (e.g. fresh water) and sink (e.g. CO2). To do this he acknowledges that we need to greatly advance our understanding of how to apply our economic, social and political tools and systems to develop ***ways to maintain our qualities of life and the resilience of communities within ecosystem limits.*** **He is currently still very active in this field.**

Achieving sustainability and resilience in the face of climate change and other societal and environmental challenges, is as much a matter of working with people, economics, business and policy as with environments. The needs are at all scales, from international and national policy making and program design, to working with individuals and communities to play their roles in managing environments, supplying food and fibre, creating innovative economies, and improving well-being. Professor Bosch is highly able to lead a team that is capable of contributing at policy and social change levels within various systems. His leadership capabilities directly contribute to the development of teams that are committed to improving national skills in working with communities, and in policies towards regional and industry governance towards the resilient social-ecological systems needed for our futures. His integration knowledge and skills help to effectively create, facilitate and coordinate platforms of collaboration. He effectively uses the broad range of scientific literacies in any University or research organisation as a whole and the existing interactions with other organisations, schools, centres and industry and the addition of integrative systems experts (and their rich interactions) to form formidable teams for further enhancement of the crossing of disciplinary boundaries within the traditional sciences.

The demand for a systems-based focus on complex issues such as sustainable and resilient communities, consumers and food security and safety, energy, and liveability is very rapidly increasing in societies around the world, and there is a great need to provide ***educational platforms*** that bring together the concepts of sustainability and systems – in physical terms (environment, resources), social constructs (institutional, community, political) and using all the tools of our economic and legal worlds (business systems, economic instruments, regulation and pricing constructs). To address this, there are some (fragmented) attempts by university schools to include concepts of sustainability, systems, integration and society in their educational programs. However, a clear need exists for ***an integrated network*** for pulling these areas, disciplines or components together to enhance and maintain quality of life issues, sustainability of our resources and environment and the resilience of communities. Due to Faculty and School structures in a university***, it will never be possible to have all the necessary components required for dealing with complex societal issues in one Faculty (or even one university). Cross-faculty, cross-university and cross-research organisational collaboration would therefore be essential. Professor Bosch has a track record of making this happen and has a wealth of experience to achieve useful outcomes for the countries, groups and organisations he works with.***

The above has led to the formation of the Alliance for **Systems Design and Complexity Management** at the University of Adelaide – a particular highlight in his career. In this position he has helped the MBA program to become a unique systems based MBA – from a collection of courses to a "system" of interconnected courses. His research has grown into a large program addressing three major leverage points for changing the way that people think:

- Evolutionary Learning Laboratories,
- "Starting with the Young" and
- Systems Education.

Prof Bosch is still active in all three these fields.

3. EXPERIENCE IN LIAISING AND COLLABORATING WITH EXTERNAL AGENCIES TO DEVELOP AND OVERSEE CO-OPERATIVE RESEARCH INITIATIVES

Professor Bosch has been putting a strong emphasis on engagement and is actively developing and maintaining productive partnerships with external bodies, locally, nationally and internationally, in particular with business, government, the professions and local communities.

As an academic and executive trainer, he regards national and international engagement as the most essential mechanism for remaining relevant and at the cutting edge in teaching and research. Apart from his own activities in this regard, he actively supports others in all activities that would help to maintain effective links with relevant government departments, the industry, organisations and communities.

Professor Bosch has been highly successful in building an international profile and extensive networks during his career. His international engagement started in 1974 when he was sent by his employer (CSIR, South Africa) to spend three months at five of the world's largest International Biological Programs (IBP) in the USA, Canada and Europe. In 1979 he was invited as a visiting scientist by the Australian CSIRO for three years, and thereafter one year with the QLD Department of Primary Industries and Fisheries on invitation to develop an **integrated research program** for the newly established $8m Arid Zone Research Institute in Longreach, Queensland. He also spent eight years as Research Director in Landcare Research NZ from 1993. It was especially during this time that his research focus, which was till then highly focused on quantitative modelling of biophysical systems, changed to participatory knowledge building and management. Human dimensions and the economics of management strategies started to play a much bigger role in his research – which provided him with opportunities to develop into a holistic systems scientist and educator. He acknowledged the value of international involvement early in his career and today spend much of his time on engaging nationally and internationally to promote his skills and knowledge in integration and systems thinking, and especially how these skills can be used to improve the livelihood of people, effectiveness of governance, designing of sustainable systems and developing resilient communities in the fast changing and turbulent world we are living in. Of particular importance is his acknowledgement of the important role that reductionist scientists play within the systems sciences – that is, the importance of reductionist hard science to give greater robustness and scientific credibility to studying the bigger picture and unravelling the complexities of issues that mankind are facing. This acknowledgement is mainly due to his "hard science" background as a quantitative ecologist and mathematical modeller and his own "discovery" of where his science fits into the bigger picture/system and its interactions and integration with the human and economic dimensions of society.

Current and recent examples that illustrate his high international profile and involvement in practice through his extensive national and international networks are mentioned under the section on '**HONOURS/DISTINCTIONS/-MEMBERSHIP OF SOCIETIES, COMMITTEES** (See above).

4 RESEARCH OUTPUTS AND OUTCOMES

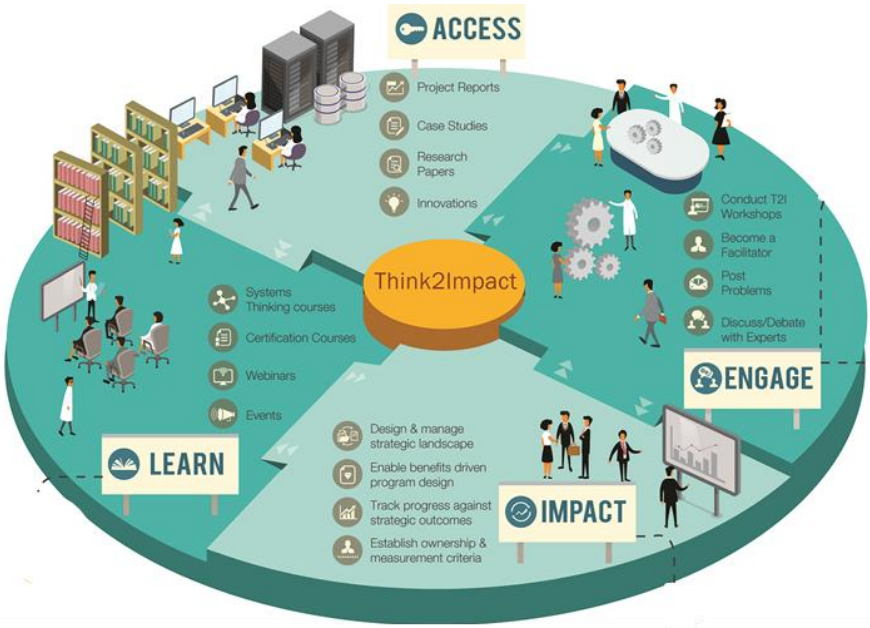
4.1 Nature of outputs and outcomes

a) Prof. Bosch's high level of international recognition as a systems scientist is evidenced by the various recent examples of his role in systems societies, election as an academician and now Vice-President of the prestigious International Academy for Cybernetics and System Sciences, appointment as a Distinguished Guest Professor at Keio University in Japan, several invitations as keynote speaker, awards, Vice Presidency of the ISSS and President from 2016-2017, etc. – to mention but a few examples of those mentioned under point 1.1 above.

b) After successful establishment of the ELLab on Cat Ba Island, Vietnam, the Haiphong Government realised the importance of the multidimensional nature of complex problems and the need for cross-departmental communication and collaboration. Prof. Bosch was requested and provided with cash and in-kind contributions to establish an ELLab for (a "World First") Integrated Systemic Governance Plan (currently ongoing project).

c) Successfully completed a Bill & Melinda Gates Foundation Project on Improving the quality of life of women in Agriculture in Sub-Saharan Africa and South-East Asia (2015)

d) The success of ELLabs and demand for its application in an increasing number of situations around the globe has led to the establishment of a Global Evolutionary Learning Lab (GELL). The extension of the ELLab concept to other countries are currently being carried using this collaborative community driven platform to engage with users to help them understand and manage complex challenges more effectively. It does this through four major hubs that enable ACCESS (to information and sharing of knowledge), LEARN (capacity building at different levels as required), ENGAGE (local workshops and linking with people in other parts of the world; platform for reflection on implementation) and IMPACT (accountability, benefit realisation and impact of systemic interventions/investments by donors). This is a major contribution to help managing the many complex issues facing our world.



e) High training demands in establishing ELLabs have led to invitations (all costs paid – and ongoing) by University of Adelaide Executive Training Unit 2015; South Australia Department of State Development 2015; SA Health 2015; Da Nang City Feb 2014, Sonoma University in the USA Jan 2013, Keio University Japan since 2011; Argentina 2011; Vietnam – seven since 2008; China 2008, 2010; UNESCO 2011; University of St Gallen 2010; International Biosphere Conference 2010; UN World Conference - Decade of Education in Sustainable Development, Bonn 2008. He also received three ALAF AusAID grants for senior and middle managers from Vietnam 2008, Cambodia 2009 and China 2011 for capacity building in systems thinking and use of systems tools.

f) Professor Bosch and his team's inputs were requested by the Board of the Tropical Savannah CRC to enhance information dissemination and introduce collaborative learning tools. He was awarded $510,000 from 2003 to 2005 to integrate his research into all projects. The Participatory Systems Analysis using Bayesian modelling in producer communities has been adopted by the North Queensland Regional Development Group as best practice to develop effective regional strategic and operational plans. This group has actively promoted the approach amongst other regional development groups across Australia through the media and demonstrations.

g) Leading the international research program on ELLabs for Systems Education by teaching four newly developed core systems courses at the University of Queensland, UoA, Singapore and at Keio University in Japan as part of his educational research.

h) He has developed and presents a prerequisite course on "Systems Change for Everyone" as part of the Malik Institute's Executive Training Program, currently being developed for online access world-wide.

4.2 Evidence for quality of research outputs and outcomes

a) The highest reward for any scientist is to see and experience how one's science is being used by others and is making a significant difference to the lives of people.

- In Vietnam top government officials use the systems concepts, tools and processes introduced by Prof. Bosch's research and capacity building in the development of their systemic management plans, solving complex problems and using the outcomes to inform policy making in all areas of governance.
- Prof. Bosch was recipient of the 2014 Medal of the Business Systems Laboratory in Italy for his **"I*nternational role in the advancements of Systems Thinking applied to Management*"** on 24 January 2014 in Rome.

b) UNESCO/MAB adopted ELLabs as best practice for its more than 580 worldwide biosphere reserves. A new publication *Ranked A journal/Cited 22* has been followed-up by recently published papers, all providing evidence of the wide acceptance of ELLabs as an effective mechanism for managing complexity.

c) Strong support from international colleagues in the development of a platform/virtual environment that is customised to enhance the knowledge-sharing and collaboration-support needs of ELLabs and the global network, GELL (invited to co-chair the IFSR Conversation on this topic).

d) A great honour and recognition of Prof. Bosch's research was the decision to hold the 57th World Conference of the ISSS in July 2013 within the first ELLab established on Cat Ba Island, Vietnam. This was a first time that a conference has mainly been designed around the activities of a single research team, providing opportunities for his past and current PhD students who received a total of $300,000+ from the Vietnamese government, a UQ Postdoctoral Fellow who received $380,000 to work under his supervision and Vietnamese top officials to show-case their work to a large world audience. The work received extensive media coverage through TV News, newspapers, and Government websites (links available on request).

e) Following the ISSS conference he received various invitations, e.g. by Da Nang and Hanoi cities in Vietnam to establish ELLabs for their governance; invitation and formally signed agreement to collaborate with FPT-Business School in Hanoi on designing a systems-based MBA and for them to become involved in the world-wide ELLab for Systems Education being led by Prof. Bosch.

f) Implementation of the program "Starting with the Young" to address the leverage point for societal change towards "a new way of interconnected thinking" through the cybernetics simulation game "Ecopolicy" in Adelaide and Vietnam High Schools and Universities has been a major success (ongoing). More than 60,000 students in Vietnam and South Australia have been involved in 2013. Prof. Bosch led the organisation of the first International Ecopolicyade during the 57th ISSS conference in Haiphong (including two teams from Australia) which attracted a high level of media coverage. The success of the cybernetics simulation game and research tool has led to the use of this learning tool as compulsory in-job training for all government officials in Haiphong province, as well as to apply their learnings to the development of systemic strategic plans for their departments. The Argentina Systems Society and the University of Patagonia have invited Prof. Bosch to introduce Ecopolicy in Argentina. **Ecopolicy ("Gaming") is being proposed to the MISK Foundation by Prof Bosch as a potential and innovative mechanism for changing the way school curricula are developed. The submission is currently being reviewed for funding ($100,000 + $1M per year for five years if Phase 1 is successful).**

PUBLICATIONS (NOTE: Only important publications of last 15 years are listed)

i. Scholarly books

1. **Bosch, O. J. H.,** N. C. Nguyen, T. V. Nguyen and Malik, C. (2019). Systems Thinking for EVERYONE: The Journey from Theory to making an Impact. 3rd Edition printed in Adelaide by Malik Australia and Southeast Asia. ISBN: 978-0-6485882-2-1
2. **Bosch, Ockie** & Cavana, Robert (2018). Systems Education for a Sustainable Planet. MDPI, Basel. ISBN 978-3-03842-789-6
3. **Bosch, O. J. H**., N. C. Nguyen and T. V. Nguyen (2016). Systems Thinking for EVERYONE: The Journey from Theory to making an Impact in Vietnam. Adelaide, Australia, SysPrac Pty Ltd; ISBN 978-0-9942356-1-9.
4. **Bosch, O. J. H**. and N. C. Nguyen (2015). Systems Thinking for EVERYONE: The Journey from Theory to making an Impact. Canberra, Australia: Think2Impact Pty Ltd; ISBN 978-0-9942356-0-2.

ii. Scholarly book chapters

5. Van Vierssen Trip, F., Nguyen, N., & **Bosch, O.** (2017). R&D productivity in the pharmaceutical industry: Scenario simulations using a Bayesian belief network. In Decision Management: Concepts, Methodologies, Tools, and Applications (Vol. 1-4, Chapter 14, pp. 302-320). doi:10.4018/978-1-5225-1837-2.ch014

6. Blachfellner, S., **O. J. H. Bosch**, V. Bulc, V. Delgado, D. Karabeg, A. Laszlo, M. F. Li, N. C. Nguyen and W. Watkins (2015). Thrivable Systems - from Vision to Reality. In Systems Thinking: New Directions in Theory, Practice and Application. M. C. Edson, G. S. Metcalf, G. Chroust, N. C. Nguyen and S. Blachfellner (Eds.), Institute for Telecooperation, Johannes Kepler University Linz, Austria; SEA-Publications: SEA-SR-41; ISBN 978-3-902457-41-7**,** pp. 14-21.
7. Laszlo, A., S. Blachfellner, **O. J. H. Bosch**, N. C. Nguyen, V. Bulc, M. Edson, J. Wilby and G. Pór (2012). Curating the Conditions for a Thrivable Planet: Systemic Leverage Points for Emerging a Global Eco-Civilization. In Edited book of the 16th International Federation for Systems Research (IFSR) Conversations "Systems and Science at Crossroads", 14-19, April 2012, Linz, Austria, SEA-Publications: SEA-SR-32. ISBN: 978-3-902457-32-5, pp. 41-65.

iii. Refereed journal articles

8. Ha, T., **Bosch, O**., Nguyen, N., & Trinh, C. (2017). System dynamics modelling for defining livelihood strategies for women smallholder farmers in lowland and upland regions of northern Vietnam: A comparative analysis. *Agricultural Systems*, *150*, 12-20. doi:10.1016/j.agsy.2016.09.008
9. Nguyen, T., Nguyen, N., & **Bosch, O**. (2017). Identifying key success factors in supply chain management for increasing the competitive advantages of Vietnamese coffee. *Competitiveness Review*, *27*(5), 438-461. doi:10.1108/CR-10-2016-0066
10. Nguyen, T., Nguyen, N., & **Bosch, O.** (2017). Enhancing the competitive advantages of Vietnamese coffee through the exploration of causal loop modelling in the supply chain. *International Journal of Logistics Systems and Management*, *26*(1), 17-33. doi:10.1504/IJLSM.2017.080629
11. Banson, K., Nguyen, N., & **Bosch, O.** (2016). Using system archetypes to identify drivers and barriers for sustainable agriculture in Africa: a case study in Ghana. *Systems Research and Behavioral Science*, *33*(1), 79-99. doi:10.1002/sres.2300
12. Banson, K., Nguyen, N., & **Bosch, O.** (2016). Systemic management to address the challenges facing the performance of agriculture in Africa: case study in Ghana. *Systems Research and Behavioral Science*, *33*(4), 544-574. doi:10.1002/sres.2372
13. Ha, T., **Bosch, O**., & Nguyen, N. (2016). Practical contributions of the systems-based evolutionary learning laboratory to knowledge and stakeholder management. *Systemic Practice and Action Research*, *29*(3), 261-275. doi:10.1007/s11213-015-9363-2
14. Ha, T., **Bosch, O.**, & Nguyen, N. (2016). Establishing an evolutionary learning laboratory for improving the quality of life of Vietnamese women in small-scale agriculture: part I - the current situation. *Systems Research and Behavioral Science*, *33*(4), 532-543. doi:10.1002/sres.2346
15. Banson, K., Nguyen, N., & **Bosch, O**. (2016). A Systems Thinking Approach to the Structure, Conduct and Performance of the Agricultural Sector in Ghana. *Systems Research and Behavioral Science*. doi:10.1002/sres.2437
16. Phan, T., Nguyen, N., **Bosch, O.**, Nguyen, T., Le, T., & Tran, H. (2016). A systemic approach to understand the conservation status and viability of the critically endangered Cat Ba Langur. *Systems Research and Behavioral Science*, *33*(6), 742-752. doi:10.1002/sres.2387
17. Nguyen, N., **Bosch, O.,** Nguyen, T., Banson, K., Tan, L., Goh, G., Lim, O., & Jupary, Z. (2016). The Economic Importance of Social Graciousness Index: A Systemic Approach to Singapore Case. *International Journal of Markets and Business Systems, 2* (2), 102-125. doi: 10.1504/IJMABS.2016.10001062
18. Nguyen, N., **Bosch, O**., Ong, F., Seah, J., Succu, A., Nguyen, T., & Banson, K. (2016). A systemic approach to understand smartphone usage in Singapore. *Systems Research and Behavioral Science*, *33*(3), 360-380. doi:10.1002/sres.2348
19. Ha, T., **Bosch, O.,** & Nguyen, N. (2016). A participatory systemic approach to rural community development in Vietnam. *International Journal of Scientific & Technology Research*, *5*(4), 53-62. Retrieved from http://www.ijstr.org/
20. Banson, K. E., Nguyen, N. C., & **Bosch, O**. (2015). A systemic intervention to access resource impact on the quality of life among women farmers in developing countries: evidence from Ghana. *Academia Journal of Agricultural Research*, *3*(2), 015-022. doi:10.15413/ajar.2015.0108
21. Banson, K. E., Nguyen, N. C., & **Bosch, O. J. H.** (2015). A systems thinking approach: 'the greater push model' for growth and sustainability in Africa - evidence from Ghana. *Int. J. of Markets and Business Systems, 1*(4), 289-313. doi:10.1504/IJMABS.2015.074208

22. Nguyen, N. C., **Bosch, O.,** Banson, K. E., Ting, O., Xuan, J., & Hui, M. (2015). A Systems Thinking Approach to address the Complex Issue of Plastic Surgery in South Korea. *International Journal of Markets and Business Systems, 1*(2), 108-135. Retrieved from http://www.inderscience.com/info/ingeneral/forthcoming.php?jcode=ijmabs
23. Nguyen, T. V., Nguyen, N. C., & **Bosch, O. J. H**. (2015). Applying a Systems Thinking approach to address the barriers affecting the Vietnamese coffee export industry. *International Journal of Business and Management Review, 3*(4): 49-65.
24. Nguyen, T. V., Nguyen, N. C., & **Bosch, O. J. H.** (2015). Coffee processing management to increase green coffee quality: A Systems Thinking approach. *International Journal of Markets and Business Systems 1*(3), pp. 181–195. doi: 10.1504/IJMABS.2015.073518
25. Nguyen, T. V., Nguyen, N. C., & **Bosch, O. J. H**. (2015). Contribution of the systems thinking approach to reduce production cost and improve the quality of Vietnamese coffee. *International Journal of Markets and Business Systems 1*(1): 53-68. doi: 10.1504/IJMABS.2015.070272
26. Ha, T. M., **Bosch, O. J**., & Nguyen, N. C. (2015). Systemic interventions addressing market access challenges of smallholder vegetable farmers in Northern Vietnam. *International Journal of Markets and Business Systems*, *1*(2), 136. doi:10.1504/IJMABS.2015.072262
27. Trinh, C. T., Ha, T., **Bosch, O.**, & Nguyen, N. (2015). "Using a Systems Approach to Improve the Lives of Women Smallholder Farmers in the North-western Mountainous Region of Vietnam." DEPOCEN Working Paper Series.
28. Trip, F. W. V. V., Nguyen, N. C., & **Bosch, O. J**. (2015). R&D Productivity in the Pharmaceutical Industry: Scenario Simulations Using a Bayesian Belief Network. *International Journal of Strategic Decision Sciences (IJSDS)*, *6*(1), 1-16.
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31. Ha, T. M., **Bosch, O.**, & Nguyen, N. C. (2015). Defining the real needs of women smallholder farmers in Vietnam: the importance of grassroots participation and multi-stakeholder collaboration. *International Journal of Business and Management Review*, *3*(2), 35-58. Retrieved from http://www.eajournals.org/
32. Banson, K., Nguyen, N., **Bosch, O**., & Nguyen, T. (2015). A systems thinking approach to address the complexity of agribusiness for sustainable development in Africa: a case study in Ghana. *Systems Research and Behavioral Science*, *32*(6), 672-688. doi:10.1002/sres.2270
33. Nguyen, T., **Bosch, O**., & Nguyen, N. (2014). Using the Evolutionary Learning Laboratory Approach to Establish a World First Model for Integrated Governance of Haiphong, Vietnam. *Systems Research and Behavioral Science*, *31*(5), 627-641. doi:10.1002/sres.2311
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38. **Bosch, O**., Nguyen, N., & Sun, D. (2013). Addressing the critical need for a "new way of thinking" in dealing with complex issues facing our societies (Best Paper Award). *Business Systems Review 2*(2): 48-70 (Special Issue - Selected papers of the first B.S.Lab International Symposium).
39. Nguyen, N., & **Bosch, O.** (2013). A systems thinking approach to identify leverage points for sustainability: a case study in the Cat Ba Biosphere Reserve, Vietnam. *Systems Research and Behavioral Science*, *30*(2), 104-115. doi:10.1002/sres.2145
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41. Nguyen, N. C., **Bosch, O. J. H**. & Maani, K. E. (2011). Creating 'Learning Laboratories' for sustainable development in biospheres – A systems thinking approach. *Systems Research and Behavioral Science, (28)*1, 51-62.

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43. Bashari, H., Smith, C. and **Bosch, O. J. H.** (2009). Developing decision support tools for rangeland management by combining state and transition models and Bayesian belief networks. *Agricultural Systems,* 99, 23-34.
44. **Bosch, O. J. H**, King C., Herbohn, J. Smith C. & Russell, I. (2007). Getting the big picture in natural resource management – Systems thinking as 'method' for scientists, policy makers and managers. *Systems Research and Behavioural Science*, 24, 217-232.
45. Smith, C., Felderhof L. & **Bosch O. J. H. (**2007) Adaptive management in practice: Making it happen through participatory systems analysis. *Systems Research and Behavioral Science,* 24, 567-587.

Iv Refereed conference papers

46. Banson, K., N. C. Nguyen and **O. J. H. Bosch** (2015). "The Greater Push" for Growth and Sustainability in Africa - Evidence from Ghana. 59th Conference of the International Society for Systems Sciences (ISSS). 2-7 August, Berlin, Germany.
47. Banson, K., N. C. Nguyen and **O. J. H. Bosch** (2015). Systemic Structure, Conduct and Performance of the Agricultural Industry in Africa: Evidence from Ghana. 59th Conference of the International Society for Systems Sciences (ISSS). 2-7 August, Berlin, Germany.
48. Banson, K. E., N. C. Nguyen and **O. J. H. Bosch** (2014). Systemic Intervention to Tackle the Constraints and Challenges Facing Stakeholders and the Performance of the Agricultural Sector in Ghana. 9th Annual System of Systems Engineering Conference, 9-13 June 2014, Adelaide, Australia.
49. Banson, K. E., N. C. Nguyen, **O. J. H. Bosch** and T. Nguyen (2013). A systems thinking approach to address the complexity of agribusiness for sustainable development in Africa: A case study in Ghana. 57th World Conference of the International Society for the Systems Sciences, Haiphong, Vietnam 14-19 July 2013.
50. **Bosch, O. J. H**., N. C. Nguyen, F. Graetz and H. Park (2015). Think2Impact: A systems-based approach for resolving complex health issues through local and global collaboration. Invited Keynote Address at the Indo-Global Healthcare Summit & Expo 2015. Hyderabad, India from July 23 to 26, 2015.
51. **Bosch, O. J. H**., N. C. Nguyen and T. M. Ha (2014). Can Advancements in Economic and Managerial Practice be achieved without Systems Thinking Education as the Foundation? Proceedings of the Business Systems Laboratory 2nd International Symposium "SYSTEMS THINKING FOR A SUSTAINABLE ECONOMY: Advancements in Economic and Managerial Theory and Practice" January 23-24, 2014, Universitas Mercatorum, Roma, Italy.
52. **Bosch, O. J. H**., N. C. Nguyen, T. M. Ha and K. E. Banson (2015). Comparative studies on improving the quality of life for women in small-scale agriculture: Empirical evidence from Southeast Asia and Sub-Saharan Africa. Proceedings of the 3rd Business Systems Laboratory International Symposium "Advances in Business Management. Towards Systemic Approach", 21-23 January, Perugia, Italy.
53. **Bosch, O. J. H**., N. C. Nguyen and K. Krishnamurthi (2014). The Evolutionary Learning Laboratory - A Better Way to Analyse and Overcome Complex Problems. European Meetings on Cybernetics and Systems Research (EMCSR). Vienna, Austria.
54. **Bosch, O. J. H**., N. C. Nguyen and K. Krishnamurthi (2014). Systems-based Evolutionary Learning Laboratories to enable Systemic Entrepreneurship in a Complex World. Invited Keynote Address at the 10th HSSS National & International Conference. Athens, Greece.
55. **Bosch, O. J. H**., N. C. Nguyen, K. Krishnamurthi, S. Hayes and W. Watkins (2015). Think2Impact – A platform for knowledge creation and dissemination to systemically deal with complex issues in a rapidly changing world. Invited Keynote Address at the 5th Annual International Conference on Business Strategy and Asian Economic Transformation (BizStrategy). Singapore from 27-28 July 2015.

56. **Bosch, O. J. H**., N. C. Nguyen and D. Sun (2013). Addressing the critical need for a "new way of thinking" in dealing with complex issues facing our societies (Best Paper Award). Proceedings of the International Symposium – The economic crisis: time for a paradigm shift ~ towards a systems approach, 24-25 January 2013, Universitat de Valencia - Facultat d'Economia, Valencia, Spain.
57. Ha, T. M., **O. J. H. Bosch** and N. C. Nguyen (2014). Application of systems thinking and an Evolutionary Learning Laboratory in defining real needs of women smallholders in Vietnam: The importance of grass-root participation and multi-stakeholder collaboration (Manuscript ID ANZAM-2014-318). 28th Australian and New Zealand Academy of Management Conference: Reshaping Management for Impact, 3-5 December 2014, Sydney, Australia.
58. Ha, T. M., **O. J. H. Bosch** and N. C. Nguyen (2014). Applying an Evolutionary Learning Laboratory approach for improving the quality of life for women smallholder farmers in the Red River Delta of Vietnam. European Meetings on Cybernetics and Systems Research (EMCSR), Vienna, Austria.
59. Ha, T. M., **O. J. H. Bosch** and N. C. Nguyen (2015). Practical Value of the Systems-based Evolutionary Learning Laboratory in Solving Complex Community Problems in Vietnam. 59th Conference of the International Society for Systems Sciences (ISSS). 2-7 August, Berlin, Germany.
60. Kiura, T., **O. J. H. Bosch**, N. C. Nguyen, S. Shirasaka and T. Maeno (2014). Appling a systems-based Evolutionary Learning Laboratory for the creation of a new business. Proceedings of the Business Systems Laboratory 2nd International Symposium "SYSTEMS THINKING FOR A SUSTAINABLE ECONOMY: Advancements in Economic and Managerial Theory and Practice" 23-24 January 2014, Universitas Mercatorum, Roma, Italy.
61. Kiura, T., **O. J. H. Bosch**, N. C. Nguyen, T. Yasui and T. Maeno (2013). Using a systems-based Evolutionary Learning Laboratory to address the "NEET" (Not in Employment, Education, or Training) issue in Japan. Proceedings of the 57th World Conference of the International Society for the Systems Sciences, Haiphong, Vietnam, 14-19 July 2013.
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"The main outcomes of my work lie in the fact that I have many opportunities to take my science out there in practice where it can make a difference to the lives of people. This honor keeps me enthusiastic, energetic and dedicated to the sharing of knowledge".

Signed: