



WAGENINGEN INSTITUTE FOR
ENVIRONMENT AND CLIMATE
RESEARCH (WIMEK)

MIDTERM SELF-EVALUATION REPORT

2007 – 2009

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Name of the Institute / Director

Institute: Wageningen Institute for Environment and Climate Research (WIMEK)

Director: Professor Dr. R. (Rik) Leemans

1. Changes in Mission and Research Programme – Future Research

Introduction

The Wageningen Institute for Environment and Climate Research (WIMEK) was founded in 1993 to organise and coordinate the research activities and PhD-education of the different environmental chair groups within the natural and socio-economic sciences at Wageningen University (WU)¹. From the start, WIMEK has been part of the Wageningen Graduate Schools (WGS). In subsequent years, WIMEK played an important role in establishing a strong inter-university graduate school in the field of environment and climate research. This became the Netherlands Research School for the Socio-Economic and Natural Sciences of the Environment (SENSE). Now, research groups from ten Dutch universities and UNESCO-IHE collaborate in SENSE and WIMEK is by far the largest participant. In June 1997, SENSE was accredited by the Royal Netherlands Academy of Arts and Sciences (KNAW) and re-accredited in 2002 and 2008 (for the period 2008 – 2013). Since 2005 Wageningen-UR and Vrije Universiteit jointly preside over SENSE.

Mission statement

WIMEK aims to develop an integrated understanding of environmental change and its impact on the quality of life and sustainability, by (i) conducting innovative scientific research, (ii) offering PhD training and education and (iii) dissemination of emerging insights and recent research results.

Elaboration of the mission statement

Research

WIMEK combines fundamental, strategic, applied and participatory research in natural and social environmental sciences. WIMEK especially promotes interdisciplinary research focusing on the interactions between ecological, chemical and physical processes and their interactions with society. This is considered to be essential for a solid contribution towards solving complex environmental problems.

Research in WIMEK strongly concentrates on the components of the cause-effect chain of environmental problems:

- The causes of environmental deterioration and climate change (human activities, causes and determinants of these activities);
- The behaviour of substances and other materials within an environmental compartment and their transfer between compartments;
- The consequences on ecosystems and society;

¹ Wageningen University (WU) is part of Wageningen University and Research Centre (WUR), which also includes specialized research institutes, such as Alterra and LEI, and the departments that execute legal tasks, such as monitoring and assessment. Wageningen UR is subdivided in five independent Sciences Groups (Animal SG, Plant SG, Agrotechnology & Food SG, Environmental SG and Social SG) in which the WU chair groups collaborate with the specialized research institutes. Wageningen Graduate Schools (PhD & research) and the Education Institute (BSc & MSc) cut through these Science Groups. The whole structure is governed by the WUR Executive Board.

- The prevention, abatement and/or mitigation of the effects of environmental stress.

Currently, twelve chair groups participate in WIMEK with their full research capacity or with a significant part of their research capacity (see Annex 1). Besides, some other chair groups contribute to the WIMEK research programme with a few senior researchers, postdocs and PhD students.

WIMEK's research programme is fully embedded in SENSE and follows the structure of the SENSE research programme. In this programme, SENSE concentrates on environmental problems in a multidisciplinary approach. The four Core Themes of SENSE reflect the main research efforts with regard to environmental change:

- Core theme 1 : Environmental contaminants and nutrients
Chair: Professor J. (Jacob) de Boer (IVM-VU);
- Core theme 2: Environmental processes and ecosystem dynamics
Chair: Professor A.J. (Jan) Hendriks (RU Nijmegen);
- Core theme 3: Global Environmental Change
Chair: Professor P. (Pier) Vellinga (ESS-WU / IVM-VU);
- Core theme 4: Sustainable development and social change: actors, institutions and governance
Chair: Professor G. (Gert) Spaargaren (ENP-WU).

In the past period (2007 – 2009) no big changes were made in the content of the research programme. But as the research funds of the Dutch government and the EU focused more on climate research (mitigation and adaptation), the size of the WIMEK climate research programme in Cores 3 and 4 increased too. New emerging research themes in WIMEK are also:

- Nano particles: nanomaterials, nanoparticles and nanotechnology; detection, characterization and fate; bioaccumulation and ecotoxicology; risk assessment and life cycle analysis (AEW, PCC, SOQ);
- Marine Resources & Ecosystem Studies (AEW, ENP, TOX).

2. WIMEK: a research institute at intermediate organizational level.

The WU chair groups that participate in WIMEK (Annex 1), are hierarchically embedded in one of the WU Departments or Science Groups and participate in one or more Graduate Schools of WGS. The Science Groups and WIMEK have different tasks and responsibilities. The staff members, PhD researchers and post-docs are appointed at a chair group within a WU-department and not at the graduate school.

The main WIMEK task is to co-ordinate, facilitate and safeguard high quality fundamental and strategic research within the framework of its multidisciplinary cross-department research programme. All PhD students participate in WIMEK. All WUR staff with a research task are accepted as a WIMEK-SENSE fellow if they meet the minimum scientific requirements of the SENSE research school (Annex 4). The WUR Executive Board also stimulates that senior researchers of the Specialized Research Institutes (e.g. Alterra) become research fellow within the graduate schools.

WIMEK thus acts at a cross-cut section between the WUR Executive Board, the Science Groups and WU chair groups at the one hand and at an intermediate level in-between the SENSE Research School and the WU chair groups at the other. The main responsibilities are:

- WUR and WU (central level) and the Science Groups are responsible for (i) human resource management policy (including PhDs with a real salary), (ii) general financial policy and (iii) education and research facilities.
- SENSE is responsible for the development of the research programme (Core Themes and research foci), the education and supervision programme, and the assessment of the general framework for PhD training and supervision.
- WIMEK is responsible for support and quality assessment of participating research groups, research staff, post-docs and PhD students. Moreover, WIMEK funds yearly (i) a few strategic PhD or post-doc research proposals; (ii) research fellowships and (iii) the development and organisation of PhD courses and activities.
- Chair Groups are responsible for the innovation and scientific quality of education (BSc, MSc and PhD courses), the acquisition and execution of research projects, and the supervision of PhD research.

Research input and output

Table 3.1 Research staff at WIMEK level

	2007		2008		2009		Average 2007 - 2009		Average 2001 - 2006	
	App*	Res*	App*	Res*	App*	Res*	App*	Res*	App*	Res*
Tenured staff (1)	75.6	27.9	75.0	29.1	73.4	26.6	74.7	27.9	n.a.	20.3
Non-tenured staff (2)	16.8	13.4	19.2	15.5	14.9	11.4	17.0	13.4	n.a.	17.2
PhD-students (3)	129.8	102.6	136.3	108.7	137.7	108.4	134.6	106.6	n.a.	59.6**
Total research staff	222.2	143.8	230.5	153.3	226.0	146.4	226.3	147.9	n.a.	97.1

* App: total appointment or total effort in fte; Res: research effort in fte. This summary is based on the overviews provided by the WIMEK chair groups with the standard calculation: Prof, assistant prof (UD) and associated prof (UHD) all have 40% research capacity; a Postdoc has 90% research capacity and a PhD has 80% research capacity (all categories; max 4 years full time; 5 years 0.8 part time; etc).

** Not comparable with previous years, because over the period 2001 – 2006 sandwich PhD students² were counted for 0.25 fte and now for 0.80 fte research input

Note 1: Comparable with WOPI-categories (HGL = Professor, UHD = Associate Professor and UD = Assistant Professor);

Note 2: Comparable with WOPI-category Researcher, including post docs;

Note 3: Standard PhD (employed) and Contract PhD's (externally or internally funded but not employed).

² Sandwich PhD students are students that have obtained a scholarship that allows them to stay respectively 6 months at the start and end of their studies. The remaining time they will work at their home institute (often in a developing country) with a local supervisor.

Table.3.2 Main categories of research output at Chair Group level*

	2007	2008	2009	Average 2007-2009	Average 2001-2006
Research programme #1 <name Chair group>					
I SCIENTIFIC PUBLICATIONS					
PhD-theses	36	30	25	30	28
Refereed articles					
▪ in Q1 ISI journals	113	157	155	142	121
▪ in Q2 ISI journals	66	41	44	50	72
▪ in Q3 ISI journals	19	17	27	21	
▪ in Q4 ISI journals	4	5	10	7	
▪ in non-ISI journals	27	30	35	31	39
Total number of refereed articles	229	250	271	250	232
Refereed books – monographs (as author)					
Total number of refereed books – monographs	0	3	1	1	4
Refereed book chapters					
▪ A: published by world class academic publishers (1)	5	1	2	3	3
▪ B: published by good class academic publishers (1)	21	13	29	21	20
▪ C: published by other academic publishers (1)	15	10	2	9	5
▪ O: other not SENSE ranked publisher		2		1	
Total number of refereed book chapters	41	26	33	33	28
Non-refereed scientific articles (2)	7	11	11	10	14
Non-refereed scientific books – monographs (as author)					
Non refereed scientific book chapters	7	10	14	10	17
Full conference papers - proceedings	72	79	46	66	92
Scientific reports	34	18	24	25	24
I - Total number of scientific publications	397	401	403	400	420
II PROFESSIONAL PUBLICATIONS (3)					
Total number of professional publications	60	55	63	59	45
III PUBLICATIONS AIMED AT THE GENERAL PUBLIC	2	98	101	67	7
IV OTHER OUTPUT OF SCIENTIFIC RESEARCH (4)					
▪ Editorships of scientific books	7	4	3	5	8

Note 1: The ranking of publishers is based on the approved list of the SENSE research school

Note 2: Articles in scientific journals that are non refereed, yet deemed important for the field

Note 3: Publications aimed at professionals in the public and private sector (professionele publicaties)

Note 4: Other types of research output, such as abstracts, patents, editorships, inaugural lectures, designs and prototypes (e.g. engineering) and media appearances

The total number of refereed scientific articles produced by WIMEK researchers is still increasing. The percentage of publications in high quality journals (top 25% ISI) increased from 52% (2001 – 2006) to 57% (2007 – 2009). This implies that both quantity and quality of WIMEK publications are still increasing. Remarkable is the big rise in the number of “publications aimed at the general public”. This rise is mainly the result of the almost weekly “Nature Messages”, produced by the staff of the “Nature Calendar” group, as part of the Environmental Systems Analysis Group, since 2008.

Table 3.3 Funding at WIMEK level in k€

	2007	2008	2009	Average 2007 - 2009
WIMEK				
<i>Funding:</i>				
Direct funding (1)	226	262	280	256
TFO budget (2)	50	74	72	65
WGS course co-ordination	4	4	4	4
SENSE - compensation for support	24	59	59	47
Strategic Research Funds (3)	260	288	349	299
Research fellowships (4)	37	26	39	34
External Review	56			
Total funding in k€	657	713	803	724
<i>Expenditure:</i>				
WIMEK Director - compensation	56	80	83	73
Personnel costs WIMEK office	101	110	116	109
Material costs WIMEK office	6	5	8	6
Housing WIMEK office & overhead		26	36	21
Annual report		9		3
PhD training & education	37	27	52	39
Rent accommodation for meetings	3	5	1	3
Congresses, international co-operation	1	20	15	12
SENSE contribution	98	103	103	101
Strategic Research Projects	252	279	321	284
Research fellowships	33	26	39	33
External Review	56			
Total expenditure in k€	643	690	774	702
Result in k€	14	24	29	22

Note 1: Direct funding by the university used to employ a small office, to compensate the WIMEK Director and to pay the SENSE contribution

Note 2: The TFO budget, also allocated by the university board, is spent on PhD training and education activities organized by WIMEK or by SENSE

Note 3: Strategic research fund, allocated by the university board, spent on strategic PhD or postdoc research projects

Note 4: Research Fellowships: this budget is allocated by the university too and is used to invite guest researchers aimed at strengthening the long-term co-operation with research groups abroad

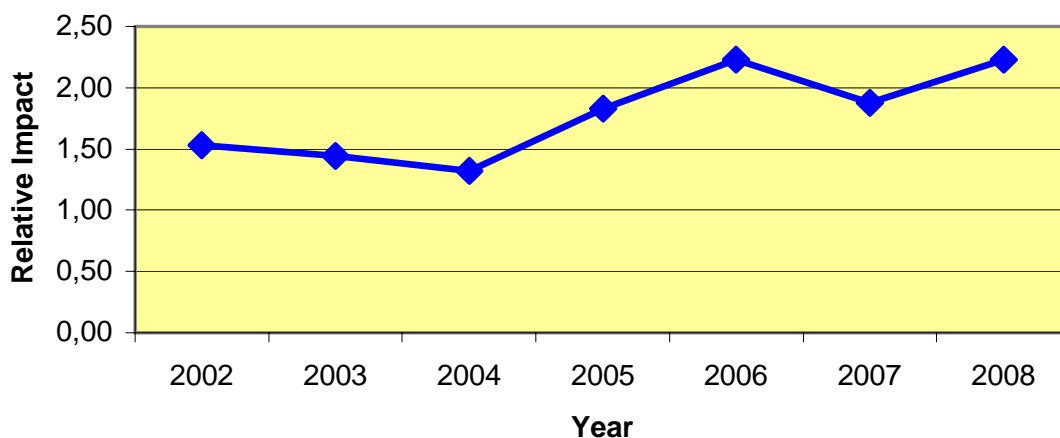
The acquisition of research projects or programmes is a task of the WIMEK chair groups and not of the WIMEK graduate school. In some cases, however, graduate schools or research schools can also apply for specific funds.

The SENSE research school, for example, participates in the EU funded Erasmus Mundus project “Linking European and Asian Networks in the field of Environmental Sciences” (LEANES); a co-operation of SENSE, Trinity College Ireland and the University of Eastern Finland (see: www.environmentportal.eu). The aim of this project is to improve the information about EU MSc and PhD Programmes in Environmental Sciences (see: www.PhDportal.eu) and to develop distance learning courses on the key issues “climate change” and “conservation biology / biodiversity”.

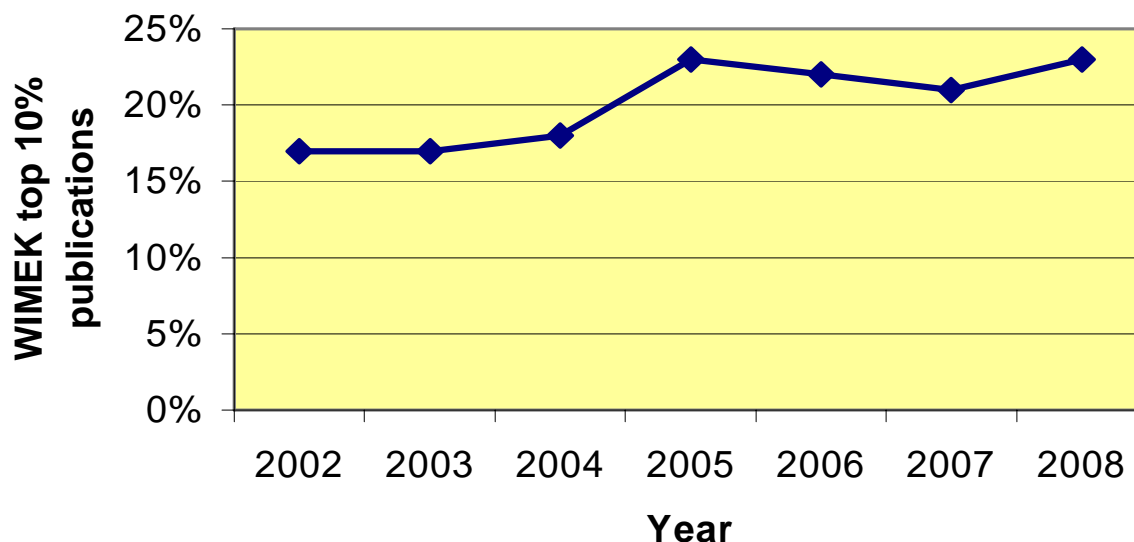
Recently the SENSE Research School has also submitted an application for the NWO Pilot Graduate School Programme. The selected Pilot Programmes will get the opportunity to appoint four excellent MSc graduates (k€ 800) as PhD student within the research programme of the Graduate School. The Graduate Programme aims at the development of an excellent research environment for highly talented young researchers, who can elaborate their own PhD research subject and choose their own renowned supervisors. At this moment the SENSE NWO application is still under evaluation.

3. Scientific Relevance

The results of a quick bibliometric analysis over the period 2002 – 2008 (Relative Impact; top 1% and top 10% cited publications) are presented in Annex 2.



The Relative Impact of the WIMEK publications over the period 2002 – 2008 is on average far above (about 80%) world average (RI = 1.8). The graph shows that the Relative Impact of WIMEK



publications has increased in the past six years.

On average WIMEK has published 20% “Top 10% cited” articles in the period 2002 – 2008. The above graph shows here also a slightly increasing line.

Proofs of esteem

SPINOZA awards

The NWO/Spinoza Prize, the highest Dutch award in science sometimes also referred to as the 'Dutch Nobel Prize', is awarded to Dutch researchers who rank among the world's top scientists. The laureates are internationally renowned, and know how to inspire young researchers. Each researcher receives one-and-a-half million Euros, to be spent on research of their choice.

The Netherlands Organisation for Scientific Research (NWO) has awarded **Professor Marten Scheffer** (Aquatic Ecology and Water Quality Management Group) one of the three NWO/Spinoza Prizes for 2009. Professor Scheffer receives the prize for his pioneering contributions to our understanding of critical transitions in complex systems, varying from shifts in shallow lakes to climate change and the collapse of ancient cultures. For more information see:

<http://www.aew.wur.nl/UK/Staff/MS/> .

In 2008, **Professor Willem de Vos** (Microbiology Group, MIB), microbiologist at Wageningen University, was one of four Dutch top researchers who received this prestigious prize for his groundbreaking research into the contribution of microorganisms to human food and health. Professor De Vos participates partly in WIMEK and partly in VLAG, the Dutch Research School on Food Technology Agrobiotechnology Nutrition and Health Sciences.

European Research Council (ERC) Grants

Moreover, in 2010, **Professor Willem de Vos** has been selected as one of the top research leaders by the European Research Council (ERC) in its second competition for "Advanced Grants". The grant (2,5 M€) will be spent on research on exploitation of our intestinal microbiota.

NWO Veni – Vidi – Vici grants 2007 - 2009

The prestigious Vidi grants (up to 800,000 euros), awarded by the Dutch Organization for Scientific Research (NWO), enable young researchers to pursue their own line of research for five years. In 2007 – 2009 Vidi grants have been awarded to the following WIMEK researchers:

- **Dr. Wouter Peters**, Postdoc at the Meteorology and Air Quality Group (MAQ), received a Vidi grant in 2008. His research focuses on deriving greenhouse gas budgets from atmospheric observations.
- **Dr. Bas van de Wiel**, assistant professor at the Meteorology and Air Quality Group (MAQ), has been awarded a Vidi-grant in 2009 for his research to get a grip on the phenomenon that winds die down and suddenly gust again on clear evenings.
- **Dr. Monique Heijmans**, assistant professor at of the Nature Management and Plant Ecology Group (NCP), received a Vidi grant in 2009 for research on the influence of vegetation on the thawing of permafrost. She will join WIMEK from 01-01-2010.

Additional Awards

Professor Arthur Mol (Environmental Policy Group, ENP) will be honoured in July 2010 by the International Sociological Association (ISA) for his work in environmental sociology. He will receive the Frederick H. Buttell International Award for Distinguished Scholarship in Environmental Sociology, awarded every four years and seen as one of the biggest prizes in the field of environmental sociology. Prof. Mol will receive the prize during the ISA's annual conference in Gothenburg in Sweden.

In August 2010, he will also receive the 2009 Distinguished Contribution Award from the American Sociological Association (ASA), for his work in environmental sociology. This will make him the first non-American to receive the prize since its inception in 1983. This will be given at the 105th Annual Meeting of the American Sociological Association, in Atlanta, USA.

Excellent PhD Candidates and Graduates

Chiel van Heerwaarden (Meteorology and Air Quality Group) received a NWO Top Talent PhD grant (about 200 k€) for research "Understanding boundary layer clouds over heterogeneous landscapes"

René Rozendal (Environmental Technology Group) invented and patented a microbial electrolysis, a novel bioelectrochemical technology for the production of hydrogen from wastewater as part of his PhD research. René Rozendal graduated his PhD Cum Laude on the 24th of October 2007 and received various research awards for his achievements: SENSE PhD award 2008; The Most Appealing Dissertation (MAD) award 2008; Honorable mention at the DSM Science & Technology awards 2008; and the DOW Energy Dissertation Prize 2009.

Other proofs of esteem

For the other proofs of esteem see the self-evaluation reports of the WIMEK chair groups. WIMEK research leaders play an active role in the scientific community as member of editorial boards, president, chair or member of scientific boards, steering committees and research committees of large international scientific programmes. Several WIMEK research leaders have a rather high "h-index" in

their research field, for example Prof. Willem de Vos - Microbiology (h > 70); Prof. Willem van Riemsdijk – Soil Chemistry (h = 53); Prof. Marten Scheffer – Aquatic Ecology (h = 38); Prof. Rik Leemans – Environmental Systems Analysis (h = 24); or belong to the most cited scientists in their research field, for example Prof. Marten Scheffer belongs to the 1 per mille most cited scientists in the research field Ecology & Environment.

4. Relevance for Society

The IPCC debate

The WIMEK-SENSE researchers were very active in the debate on ClimateGate and the so-called errors in the IPCC report. Prof. Leemans (ESA) and Prof. Turkenburg (Utrecht University) initiated a open letter to parliament (www.sense.nl/openletter) in which they regret the mistakes, suggest opportunities for improvement of the IPCC process and state that these mistakes do not alter IPCC's conclusion. Both wrote several letters-to-the-editor of Dutch Newspapers, gave interviews and published an essay in Milieu, the magazine for environmental professionals, and engaged the SENSE community actively in the debate. Finally, several WIMEK and SENSE members were also invited to a parliamentary hearing to provide a testimony and explain their views and IPCC experiences.

Examples of societal impact

WIMEK researchers play an important role in the scientific underpinning of national and international policy documents regarding climate change, reduction of biodiversity, the disturbance of ecosystems and a sustainable reform of production and consumption. They participate actively in advisory boards of governmental and non-governmental organisations and are frequently asked to comment on recent developments in newspapers, on radio and television. For more details: see the self-evaluation reports of the WIMEK chair groups.

5. Training and supervision of PhD students

The PhD education and training programme is the responsibility of the SENSE research School and will be evaluated at Research School level. Here we present the success rates of the WIMEK PhD candidates, differentiated for (i) PhD students with an appointment or employee status at Wageningen University and (ii) PhD students with a scholarship (sandwich and guest PhD students) or external PhD students

Table 6.1 Success rates regular WIMEK PhD candidates (1)

Cohort	N	< 4 year		< 5 year		< 6 year		< 7 year		Grad-T		STOP		Ongoing		Median
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	
1996	16	1	6%	8	50%	13	81%	13	81%	15	94%	1	6%	0	0%	5,1
1997	16	1	6%	5	31%	12	75%	13	81%	14	88%	2	13%	0	0%	5,2
1998	19	1	5%	7	37%	11	58%	14	74%	17	89%	1	5%	1	5%	5,2
1999	14	0	0%	4	29%	9	64%	10	71%	11	79%	2	14%	1	7%	5,3
2000	20	1	5%	4	20%	11	55%	14	70%	18	90%	2	10%	0	0%	5,6
2001	15	0	0%	4	27%	11	73%	12	80%	12	80%	2	13%	1	7%	5,2
2002	13	0	0%	3	23%	8	62%	11	85%	12	92%	0	0%	1	8%	5,6
2003	19	0	0%	7	37%	12	63%	14	74%	14	74%	1	5%	4	21%	5,2
2004	22	2	9%	7	32%	11	50%			11	50%	1	5%	10	45%	5,5
2005	20	0	0%	1	5%					1	5%	2	10%	17	85%	?
2006	21											2	10%	19	90%	?
2007	28											1	4%	27	96%	?
2008	27											2	7%	25	93%	?
2009	29											0	0%	29	100%	?
TOTAL 1996 – 2003	132	4	3%	42	32%	87	66%	101	77%	113	86%	11	8%			

Note 1: Regular PhD candidates with employee status and conducting research with primary aim / obligation to graduate (AIO; promovendus)

The table shows that in the end about 90% of all started PhD students have graduated. The median duration of all WIMEK PhD students with an employee status, started between 1996 and 2004, to finish their PhD is 5,3 years. The median duration fluctuates somewhat, but does not differ significantly for the cohorts. Please note that the PhD duration is often longer than the standard period of four years because of (i) illness, (ii) pregnancy and maternity leave, (iii) a part time appointment, (iv) job obligations in addition to the PhD research and (v) the time between finishing the final reading version of the dissertation and the graduation date (up to 6 months).

Table 6.2 Success rates contract PhD candidates (2)

Cohort	N	< 4 year		< 5 year		< 6 year		< 7 year		Grad-T		STOP		Ongoing		Median
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	
1996	7	0	0%	3	43%	5	71%	6	86%	6	86%	1	14%	0	0%	5,9
1997	12	0	0%	5	42%	7	58%	8	67%	11	92%	1	8%	0	0%	5,3
1998	15	1	7%	5	33%	10	67%	10	67%	14	93%	1	7%	0	0%	5,5
1999	18	4	22%	9	50%	10	56%	13	72%	17	94%	0	0%	1	6%	5,7
2000	19	3	16%	7	37%	8	42%	10	53%	14	74%	4	21%	1	5%	6,0
2001	23	5	22%	6	26%	10	43%	12	52%	16	70%	4	17%	3	13%	6,2
2002	21	1	5%	7	33%	12	57%	14	67%	17	81%	2	10%	2	10%	5,8
2003	19	1	5%	9	47%	12	63%			12	63%	2	11%	5	26%	5,0
2004	16	3	19%	8	50%	9	56%			9	56%	0	0%	7	44%	5,1
2005	14	1	7%	6	43%					6	43%	0	0%	8	57%	?
2006	22									0	0%	0	0%	22	100%	?
2007	18	2								2	11%	1	6%	15	83%	?
2008	10									0	0%	1	10%	9	90%	?
2009	10									0	0%	0	0%	10	100%	?
TOTAL 1996 – 2003	134	15	11%	51	38%	74	55%	73	54%	107	80%	15	11%	12		

Note 2: Contract PhD candidates without employee status, receiving external funding or university scholarship, conducting research under the authority of the institute with the primary aim to graduate (*beurspromovendus*).

Nevertheless, recent results of a PhD inquiry have shown that more than 50% of the PhD research projects is not on schedule, with an expected delay varying from 1 to more than 12 months (on average 5,6 months). The most important reasons for the delay are (% mentioned is related to the PhD students with a delay):

- Planned tasks took more time than expected (51%);
- Technical problems with research equipment and/or problems with data collection (39%);
- Research required additional knowledge or expertise (35%);
- Research developed in a different direction (35%);
- Project proposal was not clear or not focused enough (27%)
- Other teaching/research/work obligations at home institute (16%).

WIMEK has taken the following actions to decrease the delay during the PhD research and to improve the PhD progress in future:

- The WIMEK Director discusses the PhD progress of all PhD students in the management meetings with the chair groups about once in two years.
- WIMEK has developed a detailed form for the preparation of the PhD students on the yearly “research and development evaluation sessions” (R&O gesprekken). In this form PhD students

are asked whether their PhD project is on schedule and if not to explicit the courses and possible solutions to ensure that the PhD project can be finished in time.

- WIMEK has encouraged the chair groups to implement incentives to stimulate PhD students to start writing articles in time and to finish their PhD study in time for instance by granting first articles within two years.

Some results of the PhD Inquiry regarding supervision:

- WIMEK PhD students are on average satisfied about the communication with their supervisors (average score 3.8 on a 5-point scale) and about their supervision in general (average score 3.9 on a 5-point scale). Nevertheless 6 PhD students (7%) responded that they are not or totally not satisfied with their supervision and that is still too much.

WIMEK has taken the following actions to improve the PhD supervision:

- WIMEK offers – in co-operation with other WU Graduate Schools – courses for supervisors (i) Effective leadership styles; a practical course for PhD supervisors and (ii) Professional in supervision
- The results of the PhD inquiry will be discussed with all chair group leaders during the management meetings with the chair groups
- PhD students have the opportunity to consult a confidential advisor in case of problems between PhD candidate and supervisor(s)

Some results of the PhD Inquiry regarding the SENSE ITSP and PhD education and training programme:

- WIMEK PhD students are on average satisfied about the variety and quality of the PhD courses offered by the SENSE research school (average score 3.5 on a 5-point scale);
- The SENSE PhD education and training programme is regarded as a valuable and balanced mix of education and training elements to reach the competencies of a scientific researcher (average score 3.6 on a 5-point scale);

6. Reflection on the previous assessment and current trends

The full comments of the Review Committee Environmental Sciences 2007 on the WIMEK Research Institute are mentioned in ANNEX 3.

Leadership, strategy and policy

The committee remarks that WIMEK's bottom-up approach to research planning is creative but makes it difficult to develop a comprehensive research strategy and has the risk that critical research questions are overlooked. However, given the limited resources of WIMEK and the autonomy of the chair groups, the committee agrees that bottom-up research planning is perhaps the most feasible approach for WIMEK.

WIMEK has continued its bottom-up approach in the period 2007 – 2009 and we see no reason to change this successful strategy.

Resources, funding policy and facilities

Regarding the PhD policy, the committee notes positively that WIMEK has a well thought-out PhD programme which tracks students from arrival to graduation and contributes to a high success rate for Dutch and foreign students.

WIMEK will continue its contribution to the SENSE PhD education and training programme. In the coming years we will look for possibilities to strengthen our international scientific networks which are

profitable for PhD students in order to encourage and facilitate the mutual exchange of PhD students and the joint organisation of international summer schools and PhD courses.

Academic reputation and societal relevance

In the case of the hydrology research it was not clear to the programme review committee why the research was organised in three separate groups.

The discussion and decision making about the division in chair groups belongs to the responsibility of the University Board and the Environmental Sciences Group.

A general recommendation of the committee is to organise structural interactions with graduates from the PhD training to assess their experience after a number of years.

The SENSE research school has taken the initiative to develop an “alumni policy” aiming at involvement of SENSE PhD graduates in SENSE symposia, SENSE PhD courses and SENSE evaluations.

Reflection on the strengths and weaknesses

The review committee did not give specific comments we can reflect on.

7. SWOT-analysis

The WIMEK SWOT analysis 2010 does not differ significantly from the SWOT analysis 2007 and is repeated here. The changes in the SWOT analysis are presented underlined.

Strengths

- *Research niche:* WIMEK combines fundamental, applied and participatory research in natural and social sciences. This unique combination enables WIMEK researchers to integrate contributions from natural and social science research, which is considered essential to analyse complex environmental issues and develop appropriate solutions.
- *Interdisciplinary research:* WIMEK chair groups have much experience with joint interdisciplinary research programmes and projects and integrated system approaches. Intensive co-operation exists for example, between the Environmental Policy Group (ENP) and the Environmental Technology Group (ETE), between the Environmental Economics Group (ENR) and the Environmental Systems Analysis Group (ESA), and between the Hydrology and Quantitative Water Management Group (HWM) and the Soil physics, Ecohydrology and Groundwater Quality Group (SEG).
- *Quality:* WIMEK has a strong scientific basis, both in disciplinary research and in interdisciplinary research. The scientific quality, productivity and relative impact of the WIMEK chair groups is in general good to excellent.
- *International network:* WIMEK research leaders participate actively in national and international research networks, editorial boards of scientific journals, scientific advisory boards and environmental management boards.
- *International attractiveness for PhD students:* High numbers of foreign PhD students want to carry out their PhD research at WIMEK.
- *External funded research:* High success rate in the acquisition of externally funded projects (about 20% of the WIMEK research is NWO funded and about 55% is contract funded by third parties like EU, governments and industries).
- *WIMEK - SENSE:* WIMEK has a strong position in the SENSE research school. WIMEK PhD students follow the SENSE PhD education and training programme. This inter-university co-

operation increases the number of PhD students in all environmental disciplines and enables SENSE to offer a large number of PhD courses in various disciplines.

- *PhD policy*: The financial bonus of Wageningen UR for PhD graduates with a SENSE certificate is a strong incentive to stimulate all PhD students to complete their PhD education and training programme.

Weaknesses

- *WU research budget*: The very limited research budget (financial basis) per chair group from Wageningen-UR limits the initiation of curiosity-driven new research projects.
- *Steering the research agenda*: Research and Graduate Schools in the Netherlands have very limited management tools to advance new scientific developments and to implement a comprehensive research strategy. This holds for WIMEK too. Although WIMEK is able to grant two PhD or post-doc projects yearly, the WIMEK research agenda is mainly determined by the activities of our research groups.
- *Many disciplines involved*: Both WIMEK and SENSE cover a very broad range of environmental disciplines, which makes it difficult to provide in the demand of specialised PhD courses in all participating disciplines.
- *Limited participation of social science groups*. Compared to the considerable number of natural science research groups, the number of social scientists is relatively modest both in WIMEK and in SENSE.

Opportunities

- *Solving pressing environmental problems*: WIMEK and SENSE have unique opportunities to contribute to the integrated analysis and solving of complex environmental problems.
- *External research funds*: The public and policy awareness of some threatening environmental issues, like global and climate change, disturbance of ecosystems, reduction of biodiversity and particulate matter (nano particles) have resulted in large national and international research programmes and funding opportunities for WIMEK/SENSE PhD and post-doc projects.
- *Joint PhD course*: Stronger co-operation with other research schools may lead to a joint offer of PhD courses, which fulfils the demand of specialised disciplinary PhD courses.
- *Local Graduate Schools*: The expected establishment of local graduate schools, responsible for both the research masters and the PhD programme, may lead to an intensive co-operation between local university based organisations and the inter-university research school SENSE, resulting in a jointly supported PhD education and training programme of high quality.
- *International visibility*: Good international contacts result in much interest from foreign PhD students to carry out their PhD research at WIMEK.

Threats

- *Shifting research interests and priorities*: The WIMEK groups are very dependent on external environmental research funds. This means that the research opportunities of WIMEK chair groups are highly dependent on the rather unpredictable and often changing interests of governmental and intergovernmental science bodies, which finance large national and international environmental research programmes.
- *Workload*: High teaching workload of many WIMEK staff members reduces the willingness to contribute to the PhD education and training programme and to general activities of the SENSE research school (symposia, Core Theme workshops)

- *Low BSc influx*: The relatively low, but in recent years increasing, influx of Dutch students in the BSc of environmental sciences studies may undermine the strong scientific position of environmental chair groups in future.
- *Local Graduate Schools*: The current discussion about the establishment of local graduate schools may undermine the position of inter-university research schools, like SENSE, if the desired intensive co-operation can not be realised.

Analysis

WIMEK has a strong position in environmental and climate research. The international dimension of these environmental issues requires continuation of the active participation in international scientific research networks and intensive co-operation with foreign high quality research groups. The link of the WIMEK/SENSE PhD education programme with these international networks can still be improved.

Adjusted goals

There is no need to adjust our general goals at the moment.

Adjusted strategy

WIMEK will stimulate a gradual extension of structural international scientific co-operation, for instance with the Potsdam Institute for Climate Impact Research and Max Planck Institutes in the research field Global and Climate Change and with South-East and East Asian research institutes in the research field Sustainable Production and Consumption.

The co-operation between local Graduate Schools and national Research Schools should be strengthened further in order to improve the quality of the PhD education and training programme.

ANNEX 1: Overview WIMEK Chair Groups

Code	Chair Group	WIMEK Research Group Leader	%	Remarks
AEW	Aquatic Ecology and Water Quality Management Group	Prof. M. (Marten) Scheffer & Prof. A.A. (Bart) Koelmans	100 %	
ENP	Environmental Policy Group	Prof. A.P.J. (Arthur) Mol & Prof. G. (Gert) Spaargaren	55%	
ENR	Environmental Economics and Natural Resources Group	Prof. E.C. (Ekko) van Ierland	35%	
ESA	Environmental Systems Analysis Group	Prof. R. (Rik) Leemans	100%	
ESS	Earth System Science Group	Prof. P. (Pavel) Kabat	100%	
ETE	Environmental Technology Group	Prof. H.H.M. (Huub) Rijnaarts & Prof. C.J.N. (Cees) Buisman	100%	
HWM	Hydrology and Quantitative Water Management Group	Prof. R. (Remko) Uijlenhoet	100%	
IWE	Irrigation and Water Engineering Group	Prof. B. (Bart) Schulz (UNESCO-IHE) & Dr. F.P. (Frans) Huibers	20%	
LAR	Landscape Architecture Group (1)	Prof. A. (Adri) van den Brink	100%	
LUP	Land Use Planning Group	Prof. P.F.M. (Paul) Opdam	20%	
MAT	Mathematical and Statistical Methods Group	- (only one PhD student)		
MAQ	Meteorology and Air Quality Group (2)	Prof. A.A.M. (Bert) Holtslag & Prof. M. (Maarten) Krol	100%	From 01-01-2007
MIB	Microbiology Group (only Environmental Microbiology part)	Prof. W.M. (Willem) de Vos & Prof. A.J.M. (Fons) Stams	30%	
NCP	Nature Conservation and Plant Ecology Group (3)	Prof. F. (Frank) Berendse	20%	From 2010
PCC	Physical Chemistry and Colloid Sciences Group	Prof. M.A. (Martien) Cohen Stuart & Prof. H.P. (Herman) van Leeuwen	30%	
SCO	Systems and Control Group	Prof. G. (Gerrit) van Straten & Dr. K. (Karel) Keesman	20%	
SEG	Soil Physics, Ecohydrology and Ground Water Quality Group	Prof. S.E.A.T.M. (Sjoerd) van der Zee	100%	
SOQ	Soil Chemistry and Chemical Soil Quality Group	Prof. W.H. (Willem) van Riemsdijk	100%	
TOX	Toxicology Group	Prof. I.M.C.M. (Ivonne) Rietjens & Prof. A.J. (Tinka) Murk	20%	

% Indication of the part of the research effort of the group in WIMEK

- (1) The Landscape Architecture Group (LAR) did not participate in external review procedures so far. This Midterm Review is meant to determine the national and international position of the LAR group in the field of Landscape Architecture.
- (2) The Meteorology and Air Quality Group (MAQ) participated in the inter-university Buys Ballot Research School. As Utrecht University decided not to apply for re-accreditation of Buys Ballot, MAQ decided to join WIMEK/SENSE from 01-01-2007.
- (3) In 2006, the Nature Conservation and Plant Ecology Group (NCP) decided to switch from WIMEK to PE&RC from 01-01-2007, because of a switch in focus from applied towards fundamental ecology. However, the interaction between climate change and ecology remains a significant part of the NCP

University: Wageningen University
Research Institute: WIMEK – Wageningen Institute for Environment and Climate Research
Director: Professor R. (Rik) Leemans

research programme and therefore the chair group leader decided to transfer the staff, PhDs and research projects on this research theme to WIMEK again from 01-01-2010.

ANNEX 2: Bibliometric analysis of WUR publications for WIMEK 2002 - 2008

Research Field	N	C	Wavg	CPP	CI	RI	%T10 (T10)	%T1 (T1)	%NC (NC)
Agricultural Sciences	96	718	569.32	7.48	1.26	1.41	17% (16)	0% (0)	10% (10)
Biology & Biochemistry	100	1044	1410.75	10.44	0.74	0.91	4% (4)	2% (2)	6% (6)
Chemistry	126	1611	1152.74	12.79	1.40	1.46	18% (23)	1% (1)	5% (6)
Clinical Medicine	3	81	47.44	27.00	1.71	1.60	33% (1)	0% (0)	0% (0)
Computer Science	2	9	3.38	4.50	2.66	4.05	50% (1)	0% (0)	0% (0)
Economics & Business	42	415	186.08	9.88	2.23	1.97	17% (7)	5% (2)	7% (3)
Engineering	67	634	268.70	9.46	2.36	2.55	28% (19)	4% (3)	9% (6)
Environment/Ecology	621	11095	5768.50	17.87	1.92	2.06	23% (143)	5% (32)	6% (38)
Geosciences	174	2070	1182.50	11.90	1.75	2.00	26% (45)	4% (7)	5% (8)
Mathematics	5	16	18.41	3.20	0.87	0.85	0% (0)	0% (0)	20% (1)
Microbiology	86	995	1194.94	11.57	0.83	0.98	8% (7)	0% (0)	7% (6)
Molecular Biology & Genetics	4	15	98.93	3.75	0.15	0.21	0% (0)	0% (0)	0% (0)
Pharmacology & Toxicology	12	278	116.04	23.17	2.40	2.42	42% (5)	8% (1)	0% (0)
Physics	2	3	12.48	1.50	0.24	0.58	0% (0)	0% (0)	0% (0)
Plant & Animal Science	112	1299	769.22	11.60	1.69	1.63	21% (23)	2% (2)	5% (6)
Psychiatry/Psychology	2	23	31.54	11.50	0.73	0.73	0% (0)	0% (0)	0% (0)
Social Sciences, general	34	248	129.45	7.29	1.92	2.55	24% (8)	9% (3)	6% (2)
All research fields	1488	20554	12960.42	13.81	1.59	1.81	20% (302)	4% (53)	6% (92)

Year of publication	N	C	Wavg	CPP	CI	RI	%T10 (T10)	%T1 (T1)	%NC (NC)
2002	179	3850	2760.77	21.51	1.39	1.53	17% (30)	2% (4)	3% (5)
2003	207	3806	2778.98	18.39	1.37	1.44	17% (35)	1% (3)	0% (1)
2004	197	2984	2353.48	15.15	1.27	1.32	18% (35)	0% (0)	3% (6)
2005	218	3637	2015.99	16.68	1.80	1.83	23% (50)	4% (8)	6% (12)
2006	278	3885	1809.65	13.97	2.15	2.23	22% (61)	6% (18)	4% (12)
2007	194	1535	838.95	7.91	1.83	1.88	21% (41)	6% (11)	9% (17)
2008	215	857	402.60	3.99	2.13	2.23	23% (50)	4% (9)	18% (39)

University: Wageningen University
Research Institute: WIMEK – Wageningen Institute for Environment and Climate Research
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All years	1488	20554	12960.42	13.81	1.59	1.81	20% (302)	4% (53)	6% (92)
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Table 1. Explanation of all indicators used in this report	
Indicator	Meaning
N	Total number of publications in a series that is analyzed.
C	Total number of citations to the N publications.
Wavg	Sum of the world averages of baselines of citations.
CPP	Number of citations per publication.
CI	'crown indicator' of CWTS which is the field normalized citation score. This indicator corresponds to the number of citations to publications from a unit during the analyzed time span, compared to the total number of world average of citations to similar publications (of the same age and within the same research areas as for the group's publications).
RI	Relative impact or the item oriented field normalized citation score. This indicator corresponds to the number of citations to publications from a unit during the analyzed time span, compared to the world average of citations to similar publications (of the same age and within the same research areas as for the group's publications). The term "item oriented" indicates that the normalization of the citation values is done on an individual article level after which the average over all articles gives the score of RI.
%T10 (T10)	Percentage of the 10% best cited papers compared to total number of publications (Total number of publications within the top 10% best cited publications in their field).
%T1 (T1)	Percentage of the 1% best cited papers compared to total number of publications (Total number of publications within the top 1% best cited publications in their field).
%NC (NC)	Percentage of uncited publications compared to the total number publications (Total number of uncited publications).

[List of publications by \(year of publication=2002 2003 2004 2005 2006 2007 2008 AND school=WIMEK2 AND isi-nummer=*\)](#)

Bibliometric data was harvested from [Web of Knowledge](#) in week 8, (22-28 February 2010).

ANNEX 3: Assessment Report WIMEK 2007

Copy from the report “Assessment of Research Quality – Environmental Sciences”, QANU, December 2007; Evaluation of SENSE Research Institutes: WIMEK; page 20 – 23.

3.2. Wageningen Institute for Environment and Climate Research (WIMEK, Wageningen University)

Leadership, strategy and policy

The Wageningen Institute for Environment and Climate Research (WIMEK) aims to develop an integrated understanding of environmental change and its impact on the quality of life and sustainability, by

- (ii) conducting innovative scientific research,
- (iii) offering PhD training and education and
- (iv) dissemination of emerging insights and recent research results.

WIMEK has a director, a secretary and one technical staff member. In the interview with the committee, the director described WIMEK as a ‘programming unit’, a virtual organisation (no bricks), and a graduate school. WIMEK was founded in 1993 and executes a broad multi-disciplinary fundamental and strategic environmental research programme at Wageningen University, which encompasses about 100 fte staff, including the PhD’s.

WIMEK’s research is carried out by ‘chair groups’. The self assessment report shows a list of 20 chair groups that participate in WIMEK. In each chair group a full Professor, tenured staff, post-docs and PhD students work together in well-defined research projects, within the overall scope of WIMEK’s research programme. MSc students are stimulated to participate in these research projects by doing research for their MSc thesis. They are regarded as part of the scientific community and actively involved in colloquium series at chair group level. The WU chair groups that participate in WIMEK are hierarchically embedded in one of the WU Departments and participate in one or more Graduate Schools. The chair groups contribute teaching capacity to a number of bachelor and master programmes. The Environmental Sciences cluster, for instance, consists of 5 bachelor and 11 master programmes.

The mandate of WIMEK is:

- quality assessment of research proposals of PhD’s (with external reviewers)
- quality assessment of groups
- organisational reviews
- advice on appointment of professors
- allocating research grants (300 K€ per year).

The committee remarks that WIMEK’s bottom-up approach to research planning is creative but makes it difficult to develop a comprehensive research strategy and has the risk that critical research questions are overlooked. However, given the limited resources of WIMEK and the autonomy of the chair groups, the committee agrees that bottom-up research planning is perhaps the most feasible approach for WIMEK. In fact the approach has resulted in very relevant and important results. In general WIMEK has successfully consolidated expertise at WUR in the environmental research area, and has engaged in innovative research both within particular disciplines and across the disciplines.

Resources, funding policy and facilities

In the Wageningen-UR Strategic Plan 2 007 – 2 010, the WUR Executive Board has defined research priorities for the coming years in consultation with the graduate schools and the science groups. These priorities aim at:

- strengthening the knowledge base of the specialized research institutes by allocation of strategic research funds financed by the national government (especially Min. LNV) and enhancing the synergy between the specialized research institutes and the university
- identifying upcoming and fast developing research themes, which need extra financial investments in the coming years.

For WIMEK, the following high priority research themes are of particular importance:

- Sustainable development and adaptation of ecosystems and landscapes in a metropolitan context (co-ordinator: Prof. Opdam, WIMEK)
- Climate change (co-ordinator: Prof. Kabat, WIMEK)
- Bio-based economy
- Climate resistant coastal zones
- Integration of scale levels and governance.

WIMEK receives a yearly budget of approximately 350 k€ from the WUR Executive Board to support strategic research developments by financing or co-financing PhD and post-doc projects. This budget is used to support and stimulate:

- the interdisciplinary co-operation between WIMEK chair groups;
- the synergy with Wageningen-UR strategic research priorities and
- the participation of WIMEK chair groups in national and international collaborative research programmes within the WIMEK domain.

With this budget, WIMEK can fund 2 PhD's per year. According to the WIMEK director this limits the number of new curiosity driven research programmes.

The percentage of university money for the research in WIMEK is 20%, the percentage of EU and other funds is 80%. The teams are flexible; group leaders obtain their own money to do the research. The combination of natural sciences and social sciences allows the integration of research contributions, which is considered essential to analyze complex environmental issues and to develop appropriate solutions.

In the opinion of the Committee, the strategic priorities set by the WUR Executive Board for the coming years are an excellent complement to the bottom-up research strategy of the chair groups. It is appreciated that a budget of 2 M€ per year is available for promoting the synergy between natural science and social science. The themes identified by the university rightly place much emphasis on model-based opportunities to strengthen the link between knowledge and policy (on scales ranging from local to global).

Regarding the PhD policy, the committee notes positively that WIMEK has a well thoughtout PhD programme which tracks students from arrival to graduation and contributes to a high success rate for Dutch and foreign students. It is noteworthy that all WU PhD students with an approved TSP get a budget of € 2.500 to (partly) cover the costs of PhD courses (course fees) and participation in international symposia and congresses. The committee was informed that this financial policy is unique for universities in the Netherlands.

Academic reputation and societal relevance

The committee finds that WIMEK has made great progress in combining fundamental and applied research, with participatory elements and strategic perspective. The institute has made a major contribution to raising the awareness of the general public and policymakers about the importance of global change.

The WIMEK-programmes that were evaluated in this review and their scores for Quality (Q), Productivity (P), Relevance (R) and Viability (V) are as follows:

Nr.	Programme	Q	P	R	V
23	Environmental Systems Analysis Group	5	5	5	5
7	Aquatic Ecology and Water Quality Management Group	5	4	5	5
1	Environmental Policy Group	5	4	5	4
20	Soil Chemistry and Chemical Soil Quality Group	5	4	5	3,5
18	Microbiology Group (only Environmental Microbiology part)	5	4	4	3,5
8	Nature Conservation and Plant Ecology Group	4	5	5	4
19	Environmental Technology Group	4	5	5	4
15	Earth System Science Group	4	4	4,5	4,5
17	Soil Physics, Ecohydrology and Ground Water Quality Group	4	4	4	4
16	Hydrology and Quantitative Water Management Group	3,5	3	3	4,5
2	Environmental Economics and Natural Resources Group	3	3	4	3

The programme reviews show that the quality, productivity, relevance and viability of the work is good to excellent. The research covers a wide range of disciplines and shows various degrees of multi-disciplinarity. Most groups also translate their findings into policy and practice. Some groups have excellent connections with industry.

The stage of development differs strongly between the groups; some groups were recently reorganised, some show an uneven profile, understaffing or an overload of commitments. Overall excellent scores are rewarded to the Environmental Systems Analysis group (ESA). The Environmental Policy Group (ENP) also received very high grades, and has potential for more collaborative research in fields related to natural science.

In the case of the hydrology research it was not clear to the programme review committee why the research was organised in three separate groups. On the national level of hydrology research it was not clear to the programme review committee what determines collaboration in SENSE and/or in the Boussinesq Centre.

A general recommendation of the committee is to organise structural interactions with graduates from the PhD training to assess their experience after a number of years.

Reflection on the strengths and weaknesses

The SWOT analysis in the self assessment report gives a good comprehensive analysis. The committee agrees that WIMEK has a unique research niche by combining fundamental, applied and participatory research in natural and social sciences. This combination enables WIMEK researchers to integrate contributions from natural and social science research, which is considered essential to analyze complex environmental issues and develop appropriate solutions. The programme reviews confirm that WIMEK has a strong scientific basis, both in disciplinary research and in interdisciplinary research. The scientific quality, productivity and relative impact of the WIMEK chair groups is good to excellent.

Within the organizational structure of WUR, with relatively autonomous chair groups and with strategic planning initiatives from the university level, WIMEK has significantly contributed to the development of an integrative approach to environmental research (combining fundamental and applied research) and to prospective and assessment studies of environmental & global change.

ANNEX 4: SENSE Benchmarks for Publication Output 2007 - 2013

As a national research school with international ambition, the Netherlands Research School for the Socio-economic and Natural Sciences of the Environment (SENSE) requires standards to assess the quality of its scientific output. Such performance standards are important:

1. As a yardstick for the evaluation of the overall progress of the School;
2. As a benchmark for the membership of researchers and institutes in the School; and
3. As a jointly agreed comparative measurement for the 6-year external evaluation of institutes and research departments.

SENSE has developed in 2006 a first set of performance criteria that was used for the 2007 evaluation. These criteria have met criticism from the SENSE community, and the School has decided to adjust the system. Drafts of the (modest) adjustments have been circulated to all research group leaders of SENSE, and many comments and suggestions have been incorporated. This final system of the 'SENSE Benchmarks' is supported by the SENSE General Board, the SENSE Research Commission, and the SENSE Board of Directors. It is valid for the period 2007-2013.

SENSE grants credit points for:

- *Authors* of scientific books (with more than 80 pages), articles in scientific journals and chapters in scientific books;
- *Editors*, namely editors-in-chief of a journal, editors of special issues and editors of books; as well as
- *Promoters, co-promoters* and *candidates* for the successful defence of a doctoral dissertation.

Each author or editor of a publication receives the same credit points.

SENSE distinguishes between A, B, and C journals:

- An 'A journal' is a journal listed in the Web of Science (ISI) that belongs to the top 25% of all journals in any ISI domain, ranked according to citation impact factor.
- A 'B journal' is any other journal listed in the Web of Science.
- A 'C journal' is any other journal that maintains a professional system of peer review.

The list of ISI journals including impact factors, journal ranking per domain and quartile ranking will be available on the SENSE website and updated every year. The list is based on the data provided by the METIS database used by all universities for registration of scientific publications.

As for books, SENSE distinguishes between A, B, and C publishers:

- 'A publishers' are the world top of publishers,
- 'B publishers' are the world's semi-top of publishers,
- 'C publishers' are other scientific publishers.

The current list of publishers is available on the SENSE website. SENSE will revisit the lists of publishers and base the system on a broader and more systematic approach, based on a global, internet-based survey among environmental scientists to ascertain whether publishers are seen as

world class or semi-world class. This process will be finalised by early 2009. Given the more stable reputation of publishing houses, the eventual list will remain valid until 2013.

SENSE members are expected to achieve **8 credit points per year**, measured on average over three years and based on a full-time position. For part-time positions—including maternity or paternity leave—the benchmark is adjusted accordingly.

SENSE will assess the research output of all SENSE members in the upcoming period twice, 2010 and 2013 (the latter one in the context of the overall external evaluation of SENSE).

The following table lists the credit points for each category of publication output:

Credit Points for Publication Output (2007-2013)

Classification		A	B	C	Comments
Journal Papers	Description	Top-25% of domain in ISI Impact factor	All other peer-reviewed journals covered by ISI	Peer-reviewed journal, no ISI Impact factor	The classification of journals is updated every year. Papers are rated based on the classification in year of publication
	Score	5	4	2	
Journals	Editor-in-Chief	3	2	1	
	Editor Special Issue	3	2	1	
Book Chapters	Description	World class publishers	Semi world class	Other publishers	The final rating of publishers will be done in early 2009, based on an international survey.
	Score	4	3	1	
Books	Description	World class publishers	Semi world class	Other publishers	The final rating of publishers will be done in early 2009, based on an international survey. Books > 80 pages
	Score	12	9	3	
Edited books	Description	World class publishers	Semi world class	Other publishers	The final rating of publishers will be done in early 2009, based on an international survey.
	Score	3	2	1	
Other Activities	Promotor		2		In year of successful defence of thesis.
	Co-promotor		2		
	Candidate		4		