

South Africa – Norway Programme for Research Co-operation

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1 Assessment of current and future emissions of mercury from anthropogenic sources in South Africa

Responsible University/Institution, Norway :

Norsk institutt for luftforskning

Principal Investigator, Norway :

Pacyna, Jozef M. Professor

Project no: 179784/S50

Financed by RCN :

1.4.2007-30.6.2010

2007: **75,000** 2008: **75,000** 2009: **75,000**

Responsible University/Institution, South Africa:

CSIR Water Recourses

Principal Investigator, South Africa:

Leaner, Joy Dr.

Financed by NRF:

2007: **114, 529** 2008: **59, 774** 2009: **48, 844**

Mercury is one of the most important contaminants emitted to the atmosphere due to its toxic effects on the environment and human health, as well as its role in the

chemistry of the atmosphere. Although substantial information has been collected on environmental effects of mercury and its behaviour in the environment much less data is available on atmospheric emissions of the element. Information on emissions is needed for various policy and modeling purposes. This information is very limited for sources and emissions in South Africa. The main goal of the proposed project is to provide a thorough assessment of current and future emissions of Hg to the air, water and land from anthropogenic sources in South Africa. An assessment of emissions from natural sources will also be made.

2 Assessment of estuary dependency and management of two important fishery species

Prosjektansvarlig:

NINA Hovedadm.

Prosjektleder:

Næsje, Tor F. Seniorforsker

Prosjektnr: 179811/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **165,000** 2008: **260,000** 2009: **382,000**

2010: **140,000**

Responsible University/Institution, South Africa:

SAIAB (South African Institute of Aquatic Biodiversity)

Principal Investigator, South Africa:

Cowley Paul D., Dr

Financed by NRF:

2007: **330,990** 2008: **341,020** 2009: **218,654** 2010: **50,150**

The dependency on critical habitats, such as estuaries, represents a bottleneck in the life-history of many exploited fishery species. The proposed project aims to assess the management implications of estuarine dependency in two important South African coastal fishery species, spotted grunter (*Pomadasys commersonnii*) and dusky kob (*Argyrosomus japonicus*). The poor stock status of both species has been ascribed, in part, to the overexploitation of juveniles during their obligatory dependence on estuarine habitats. A rational management plan for these species cannot be developed without explicit information on their movement patterns and ontogenetic use of estuaries. Despite heavy exploitation of juveniles within estuaries, the same stocks also support coastal and marine fisheries. Therefore, successful management for these species relies on knowledge of their dispersal characteristics, migrations

between estuaries and the sea, and the possible movements between neighbouring, nearby and/or other estuaries.

This study will assess ontogenetic changes in habitat use and the movement patterns of individuals between their natal estuary, other estuaries and coastal areas, using otolith microchemistry and acoustic telemetry methods. The results will provide improved knowledge on two of South Africa's most data-deficient fisheries, namely estuarine and subsistence fisheries, and be used to (i) evaluate the role of single estuaries in the production and export of juveniles to coastal fisheries, (ii) evaluate the role of protected areas as a management option to assist with restoring spawner stock biomass levels, (iii) develop an appropriate management procedure to ensure sustainability, and (iv) form the scientific basis for capacity building and education of students.

The project promotes capacity building, equity redress and research excellence through collaboration during fieldwork and publication of project results.

3 Gender in the Deliberative Public Sphere

Responsible University/Institution, Norway :

Handelshøyskolen BI

Principal Investigator, Norway :

Lippe, Berit von der Førsteamanuensis

Project no: 179814/S50

Financed by RCN :

1.5.2007-31.12.2009

2007: **39,620** 2008: **43,582** 2009: **68,078**

Responsible University/Institution, South Africa:

University of Cape Town

Principal Investigator, South Africa:

Salazar, Philippe-Joseph Dist. Prof.

Financed by NRF:

2007: **90,543** 2008: **97,877** 2009: **136,665**

The question of the gender in relation to rhetoric studies understood as the discipline tasked with studying public argumentation and popular deliberative practices that are at the heart of a social and liberal democracy, has undergone radical developments in the past twenty years. It has led to a diversification of rhetoric theory and practice concerning democracy and deliberation, and, in keeping with Third Wave Feminism, has made rhetoric studies a field of excellence to re-examine gender-in-politics.

South Africa's consolidated democracy stands firmly by its constitutional principle of non-discrimination on the basis of gender as well as a sustained policy of gender redress and progress (if 52% percent of South Africans are women, 29% are elected town councillors and 18% are mayors, while their ratio in Parliament is one of the highest among democratic states). South Africa offers a field of enquiry on the rhetoric of gender on a new and

challenging scale, unknown before in the South, while Norway provides a touchstone or reference for achieving gender parity.

4 Radiation hardness of some wide band gap materials used for daylight blind UV detectors

Prosjektansvarlig:

Det matematisk-naturvitenskapelige fakultet, Universitetet i Oslo

Prosjektleder:

Svensson, Bengt Gunnar Professor

Prosjektnr: 179898/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **208,000** 2008: **283,000** 2009: **328,000**

2010: **161,000**

Responsible University/Institution, South Africa:

University of Pretoria

Principal Investigator, South Africa:

Auret, Francois Danie Professor

Financed by NRF:

2007: **256,770** 2008: **238,950** 2009:

271,350 2010: **79,380**

The performance of UV sensitive detectors has steadily increased over the last decades, and astronomical as well as terrestrial applications benefit from this evolution. These UV detectors have made possible the success of several solar missions and are now also finding application in the fabrication of user-friendly UV detectors for the prevention of skin cancer. However, the common Si-based UV-detectors exhibit some drawbacks that are difficult to overcome, including the issues of cooling and filtering to detect only a specific UV wavelength. These drawbacks can be resolved by using wide band-gap materials like GaN, SiC, ZnO and diamond. These materials can operate at elevated temperatures and, by a proper design, the detector requires no spectral filtering via additional coatings. In particular, their wide band-gaps facilitate the construction of so-called daylight (solar) blind UV detectors which do not respond to radiation from the visible or infrared spectra but only to 'UV light'. During the manufacturing of UV detectors and in their operation afterwards, defects are introduced in them due to their exposure to energetic particles. In this project we

intend comparing the introduction rates of defects in GaN, SiC, ZnO and diamond, during processing as well as afterwards during controlled irradiation with high-energy particles. The results will show which of these four materials is the least affected by radiation. The radiation hardness of the materials will be assessed by, firstly, manufacturing UV detectors on the four materials and, secondly, exposing them to MeV electrons, protons, He- and heavy-ions and then determining the defect introduction rates and free carrier removal rates. These results will be of great value both fundamentally and to the UV detector and spacecraft industries.

The project implies heavy involvement by both research teams and constitutes a good example of sustainable research co-operation on equal partnership.

5 Dating human occupations and reconstructing the palaeoenvironment in the Middle Stone Age, southern Cape, South Africa

Responsible University/Institution, Norway :

Institutt for geovitenskap, Universitetet i Bergen

Principal Investigator, Norway :

Lauritzen, Stein-Erik Professor

Project no: 180285/S50

Financed by RCN :

1.4.2007-30.9.2010

2007: **173,300** 2008: **197,300** 2009: **197,300**

Responsible University/Institution, South Africa:

University of Witwatersrand

Principal Investigator, South Africa:

Henshilwood, Christopher Professor

Financed by NRF:

2007: **425,000** 2008: **401,000** 2009: **401,000**

We present a research, networking and training programme centered on the archaeology of the Middle Stone Age (MSA) in the southern Cape region of South Africa. We believe this research will contribute significantly to present knowledge of the MSA in this region and enable fine tuning of current dates for the Still Bay and earlier MSA deposits both at Blombos Cave and for selected caves in De Hoop Nature Reserve. Isotope analysis and uranium series dates of speleothems and flowstones will help refine current understanding of the climate and sea levels during these occupations. The project will provide excellent training in excavation techniques, artefact analysis, dating methods and palaeoenvironmental reconstruction for South African and Norwegian students at graduate, Masters and Ph. D level.

6 From transmission of tradition to global learning: African Islamic education, c. 1800-2000

Responsible University/Institution, Norway :

Det samfunnsvitenskapelige fakultet, Universitetet i Bergen

Principal Investigator, Norway :

Bang, Anne Katrine Forsker

Project no: 180288/S50

Financed by RCN :

1.4.2007-31.12.2009

2007: **146,000** 2008: **353,000** 2009: **181,000**

2010: **0**

Responsible University/Institution, South Africa:

University of Cape Town

Principal Investigator, South Africa:

Jeppie, Shamil Dr

Financed by NRF:

2007: **210,780** 2008: **137,160** 2009: **297,000**

2010: **75,060**

Researchers from the University of Cape Town and the University of Bergen will collaborate on a historically-grounded project focusing on the growth and transformation of a widespread form of basic traditional education in parts of Africa with large Muslim populations. A central concern of this project is how these institutions have changed and how they are been used in response to a variety of colonial, post-colonial and globalizing pressures.

7 Levels and Implications of Persistent Organic Pollutants and other contaminants in South Africa

Prosjektansvarlig:

Norges veterinærhøgskole

Prosjektleder:

Skåre, Janneche Utne Forskningsdirektør

Prosjektnr: 180291/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **200,000** 2008: **200,000** 2009: **120,000**

2010: **138,000**

Responsible University/Institution, South Africa:

North West University

Principal Investigator, South Africa:

Bouwman, Hindrid Professor

Financed by NRF:

2007: **180,000** 2008: **240,000** 2009: **160,000**

The lack of knowledge concerning organic pollutants in South Africa, within the context of the Stockholm Convention (SC) on POPs, is the reason for the thrust of this application. The three partners, the Norwegian School for Veterinary Science (project owner), Norwegian Institute of Air Research, and the North-West University in South Africa, form the consortium for this project.

Through combining existing knowledge, expertise, capacity and resources, we aim to investigate the presence and levels, and determine the preliminary risks associated with selected persistent organic pollutants in soil, bird eggs and human milk from the Vaal Triangle, the most industrialised area in South Africa. Existing data indicates high levels of some of the pollutants, while for others it will be the first such analysis.

By extracting the samples in SA (after training of two NWU persons in Norway), and doing most of the analysis in Norway, we aim to optimise the number of samples that can be done, and generate sufficient knowledge for preliminary risks assessments, identification of priorities and avenues for further investigations, and to contribute towards the SC aims for both countries.

8 Witwatersrand Central Basin Mine Water Apportionment Pilot Study

Prosjektansvarlig:

Norsk institutt for vannforskning

Prosjektleder:

Røyset, Oddvar Seniorforsker

Prosjektnr: 180292/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.5.2007-30.9.2010

2007: **200,000** 2008: **295,000** 2009: **165,000**

2010: **109,000**

Responsible University/Institution, South Africa:

Council for Geoscience

Principal Investigator, South Africa:

Strachan, Leslie Manager

Financed by NRF:

2007: **180,000** 2008: **295,000**

2009: **205,000** 2010: **90,000**

NIVA and CGS are to embark on a pilot study to develop methodologies and techniques to determine ecological footprints and volumetric contributions for apportioning liability for sustainable management of pollution and water ingress into underground gold mine openings of the Witwatersrand Central Basin, South Africa.

Water is ingressing into the underground mine voids in the Central Rand Basin of the Witwatersrand, necessitating dewatering of operational areas through pumping. Such pumping also ensures avoidance of sterilization of remaining gold reserves.

The CGS has been tasked by the South African Department of Minerals and Energy (DME) to identify sustainable management options to, amongst other objectives, apportion liability of costs to polluters and/or contributors to ingress and water contamination.

Furthermore, regional mine closure strategies are being developed to ensure that there is a financial provision for sustainable environmental management, once mining operations cease. Based upon the polluter pays principle adopted by the DME, apportioning of such financial liability in the industrial area of the Central Rand Basin and environs is critical to implement such mine closure strategies. A scientific basis for such apportionment is planned in this pilot project. This groundbreaking approach has not been attempted anywhere else in the world, and would serve as a pilot approach for other areas similarly impacted by mining operations in South Africa, and further afield in areas of Africa where an immature mining industry exists.

Apportioning liability for environmental problems is a contentious issue with high potential for legal objections from identified impactors or contributors. The involvement of NIVA, an independent, impartial, non-partisan, and credible international water research institution would bring legitimacy to the research and apportionment process likely to reduce the risk of objections from affected parties.

9 A study of HIV and AIDS in relation to people with disability in South Africa

Prosjektansvarlig:

SINTEF - Oslo

Prosjektleder:

Eide, Arne Henning

Prosjektnr: 180293/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-1.4.2010

2007: **150,000** 2008: **200,000** 2009: **200,000**

2010: **100,000**

Responsible University/Institution, South Africa:

University of Stellenbosch

Principal Investigator, South Africa:

Swartz, Leslie Professor

Financed by NRF:

2007: **250,000** 2008: **400,000** 2009:

400,000

2010: **150,000**

This project aims to look at different aspects of HIV/AIDS and disability in South Africa. It is hypothesized that people with disabilities face a higher risk of HIV infection. To understand the effects of HIV on people with disabilities one must look at the status society awards them in relation to HIV and AIDS, the sexual practices of this group, as well as their knowledge, attitudes, practices and their access to HIV and AIDS prevention programs.

Issues linking disability and HIV and AIDS can be grouped under:

- Sexual Practices

- Vulnerability and issues of sexual abuse

- Lack of accessible information/ Lack of knowledge

- Lack of services that are disability friendly (i.e. are inclusive and welcome the participation of disabled people and are not judgemental in their attitudes and are accessible in all aspects of their operation)

10 The role of social capital in promoting community based care and support for people living with HIV/AIDS in KwaZulu-Natal, South Africa

Prosjektansvarlig:

Det samfunnsvitenskapelige fakultet, Universitetet i Oslo

Prosjektleder:

Duckert, Fanny Professor

Prosjektnr: 180309/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **95,000** 2008: **179,000** 2009: **189,000**
2010: **144,250**

Responsible University/Institution, South Africa:

University of Kwazulu-Natal

Principal Investigator, South Africa:

Sliep, Yvonne Dr

Financed by NRF:

2007: **305, 000** 2008: **370, 000** 2009:
400, 000 2010: **209, 000**

With the number of South Africans infected with HIV/AIDS soon exceeding 6 million, care and support for the people infected and affected is becoming increasingly more important.

Most care and support is carried out in the communities, by community members within a highly stigmatised environment with little government support. It is therefore crucial to strengthen community capacity to provide care and support for the ill. Previous studies have focused on individuals, families, caregivers and organisations providing care separately with little focus on how to these work together. In this study, we explore the levels, elements and mechanisms of social capital in relation to care and support for people living with HIV/AIDS. Social capital is defined as 'the norms and networks that enable people to act collectively'. We examine the three forms of social bonding, bridging and linking at the levels of individuals, families, community based organizations, and government/external agents. According to our knowledge, this is the first study that will be done addressing all three levels of social capital within an HIV/AIDS context. The longitudinal study takes place in a rural poor community in KwaZulu-Natal. We use a multi-method approach within a framework of participatory action research and ethnography. To conduct the fieldwork, we will recruit local people as well as Zulu-speaking students. The study moves through stages of exploring, analyzing, acting on and evaluating aspects of social capital in relation to care and support in the area. At the end of the study, we aim at creating a local base where agencies and activities can be monitored, assisted and strengthened. This would promote sustainability of the project. An additional outcome of the study is the development of a model to strengthen social capital and improve care and support in similar communities.

11 Khoe-San Culture, Language and Memory in South Africa

Prosjektansvarlig:

**Fakultet for humaniora, samf.vitensk. og
lærerutd., Universitetet i Tromsø**

Prosjektleder:

Saugestad, Sidsel Professor

Prosjektnr: 180317/S50

Bevilgningsperiode og finansiering fra Norges
forskningsråd:

1.4.2007-31.3.2010

2008: **190,000** 2009: **220,000** 2010: **40,000**

Responsible University/Institution, South

Africa: **University of the Free state, Faculty of
Humanities**

Principal Investigator, South Africa:

Financed by NRF:

2007: **503 000** 2008: **489 000** 2009: **199 000**
2010: **145 000**

The project has two main components.

One component comprises networking and research collaboration with regional universities with research profiles addressing Khoe-San/indigenous issues (e.g. University of Namibia, University of Botswana and the University of the Western Cape) and the University of Tromsø, through the Department of Social Anthropology and the Centre for Saami Studies. These activities will contribute to the development of Khoe-San research competence and capacity at the University of the Free State. The main collaborators in the Culture and Memory project will serve as a reference group for the research project, advise PhD students affiliated with the project, and carry out independent fieldwork as appropriate.

The other component is a longitudinal interdisciplinary research project, involving anthropologists, historians and linguists, embedded in the network activities. The research will examine the nature and dynamics of Khoe-San culture, language, memory, identities and representations in South Africa. Drawing especially on data from the 1936 South African population census, which also enumerated Khoe-San language speakers, the project will seek remaining Khoe-San language speakers in the country (a number of whom have already come to the fore after 1994), as well as their immediate descendants, and record and analyse their cultural and linguistic memories and life histories. Their life histories should yield valuable insights into the historical dynamics of Khoe-San culture, language, identity and memory in South Africa. Their life histories and memories should also challenge widely held misconceptions about the Khoe-San heritage in South Africa, especially the view that the Khoe-San and their cultures and languages are long extinct. This perception has inclined those in positions of power, including academics, to neglect the living Khoe-San heritage.

12 Land at last - Criteria for success in South African land redistribution

Prosjektansvarlig:

Norsk institutt for by- og regionforskning

Prosjektleder:

Wiig, Henrik Postdoktorstipendiat

Prosjektnr: 180318/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-31.3.2010

2007: **215,871** 2008: **270,172** 2009: **144,801**

2010: **50,000**

Responsible University/Institution, South Africa:

University of Kwazulu-Natal

Principal Investigator, South Africa:

May, Julian Director

Financed by NRF:

2007: **83, 598** 2008: **326, 789** 2009:

284, 902 2010:**123, 868**

The black population expected redistribution of land when the apartheid regime fell. However, the land reform had a rather slow start but the redistribution program is now speeding up. Close to 15.000 households are now receiving grants each year, which is mainly used to buy land which was earlier part of large estates owned by white commercial farmers. The South African Land Reform Program first only benefited poor families, but more successful entrepreneurs can now receive grants to as part of the black empowerment approach. As land redistribution speeds up, it becomes vital to analyse the experience until now in order to make the program as useful as possible towards its twin ends: (i) poverty alleviation and income redistribution and (ii) black empowerment.

We will have access to a novel cross section data set from the Quality of Life 2005 survey made by the South African Land Reform Program. Its specific design with 2000 program beneficiaries and 2000 pairwise "identical" non-beneficiaries opens for valid impact assessment of the program. The large number of observations furthermore makes it possible to single out the characteristics of the households and communities that have been able to improve their lives through the land grants compared to the less successful ones. Are the individual characteristics like education that is most important, or to access to infrastructure, transport and the local institutions and social capital more important? What is the role of regional differences that is already reflected in the existing income distribution.

The results from this econometric analysis is the starting point for a quantitative field studies that will disclose the

dynamics of how the significant variables actually affects the results. This will be a separate result in itself, and in addition opens for more specific design of the econometric models in a second iteration.

13 The WTO-Doha and the Economic Growth for The Rural Poor

Prosjektansvarlig:

Universitetet for miljø- og biovitenskap

Prosjektleder:

Wisborg, Poul Professor

Prosjektnr: 180319/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **167,000** 2008: **157,000** 2009: **98,000**

2010: **89,000**

Responsible University/Institution, South Africa:

University of Western Cape

Principal Investigator, South Africa:

Jacobs, Peter Dr.

Financed by NRF:

2007: **196, 350** 2008: **172, 550** 2009:

163, 200 2010: **56, 950**

Agricultural trade liberalization is high on the agenda for the World Trade Organisation, specifically underscoring the potential positive effects for the world's poor. This project will study how better international market access will "trickle down" to rural livelihoods in the developing world. The project focuses on the effects from trade to rural economic growth and development. Based on a theoretical analysis of these effects both short run and long run effects will be studied, using data from South Africa. The project will study both the direct effects for agricultural products, and indirect effects from improved market access.

14 Broken Women, Healing Traditions? Indigenous resources for gender Critique and Social transformation in the Context of AIDS in South Africa.

Prosjektansvarlig:

Det teologiske fakultet, Universitetet i Oslo

Prosjektleder:

Salomonsen, Jone Professor

Prosjektnr: 180322/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.7.2007-30.9.2010

2007: **170,543** 2008: **282,047** 2009: **224,047**

2010: **357,526**

Responsible University/Institution, South Africa:

University of Kwazulu-Natal

Principal Investigator, South Africa:

Phiri, Isabel Apawo Professor

Financed by NRF:

2007: **21, 145** 2008: **304, 528** 2009: **217, 548**

2010: **355, 073**

The success in combating AIDS may depend upon whether we are able to support women's agency and emerging leadership roles, overcome the overly moralist and curative discourse of AIDS and extend the field to include a deeper, communal healing approach. This must include women's yearning for radical social change, be alert to a new field of ritual invention and appropriation at the interface of Christian and indigenous resources. In this field mother's try to protect their daughters, rework violent experiences and invoke new hopes for the future by renegotiating faith and what it means to live womanly with balanced social relations. The yearning for change has the effect of ongoing creative activity in reconstituting rituals and making them new and powerful in the present. Our research will be based on ethnographic and narrative methods and contribute to an understanding for why women re-appropriate African indigenous knowledge systems in order to find tools for healing and fight for social and gendered changes. What do these resources consist of, and to what extent do they include visions of new partnership models between women and men? Which roles do mediators as male and female Sangomas play in interpreting, bridging and filling them with power? It is important to learn how this work is orchestrated socially and incorporated ritually to help guard integrity and boundary of the subject. Re-appropriation of tradition is not a culturally or politically innocent move but is itself in need of critical examination, in our case, with the discipline of theology and its critical discourse on autonomy versus interdependence. This study provides new knowledge for critical gender studies and the religious construction of gendered personhood. It raises critical questions for how we construct interventions in the field by asking how we can contribute to building healing communities of active prevention and self-education.

This is a study of how indigenous social and religious resources are retrieved in order to assist just power relations between women and men in context of AIDS.

By drawing upon African and Christian interreligious practises in the making and social recognition of protective, ritual and untouchable space, we will contribute to build healing communities of active prevention and self education.

15 DDT and "current use pesticides" in mothers and children in a malaria control area in South Africa

Prosjektansvarlig:

Norsk institutt for luftforskning

Prosjektleder:

Kylin, Henrik Seniorforsker

Prosjektnr: 180325/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.7.2007-30.9.2010

2007: **150,000** 2008: **210,000** 2009: **126,666**

2010: **128,334**

Responsible University/Institution, South Africa:

Medical Research Council

Principal Investigator, South Africa:

Röllin, Halina Dr.

Financed by NRF:

2007: **224, 800** 2008: **330, 400** 2009:

270, 400 2010: **60, 000**

The effects of environmental pollutants on human health are often subtle, long-term, sometimes transgenerational and difficult to measure even in long-term epidemiological studies in large populations. There is therefore a need for comprehensive research that monitors the concentration and distribution of toxic substances in humans. A number of persistent toxic substances are recognised as being responsible for adverse development and health effect in children. The growing foetus and newborn child are especially sensitive to the toxic effects of many environmental pollutants, and several of them move from mother to foetus via the umbilical cord and to the child via mother's milk. Of particular concern are long-term, subtle effects that might influence reproductive health, pregnancy outcomes, reduce defence against diseases, affect the children's mental development, or increase the risk of cancer.

Within this project we intend to obtain data on the current levels in mother's blood and milk of DDT and other pesticides used for malaria vector control and/or in agriculture in Northern KwaZulu-Natal, to evaluate the exposure to foetuses and children of the target chemicals,

and to investigate if their main source is the malaria control programme or agriculture. We will take samples from areas where there is an active malaria vector control with DDT and other compounds and from areas where malaria vector control is not needed. In KwaZulu-Natal such areas are located quite close to each other and have essentially the same conditions for agriculture and social life. We, therefore, expect to be able to distinguish between pesticide residues that are due to malaria control activities and those that have other sources, e.g., agriculture. The data will be compared with general medical history, reproductive outcome and child development. Ultimately the data can be used in policy decisions on appropriate malaria vector control procedures.

16 Southern Ocean Biogeochemistry: Education and Research

Prosjektansvarlig:

Uni Research AS

Prosjektleder:

Bellerby, Richard G J Seniorforsker

Prosjektnr: 180328/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **360,000** 2008: **130,000** 2009: **60,000**

2010: **106,000**

Responsible University/Institution, South Africa:

CSIR

Principal Investigator, South Africa:

Monteiro, Pedro M.S. Dr.

Financed by NRF:

2007: **408,002** 2008: **470,000** 2009: **300,000**

With extreme oceanographic variability over very short distances, the waters around South Africa provide a wealth of information on the mechanistic controls on marine biogeochemical variability. South African waters occupy a special niche in oceanography lying at the junction between western and eastern boundary systems and the Southern Ocean. This natural laboratory offers a special opportunity to research oceanographers to study a range of different mechanisms impacting on the regional biogeochemistry. Both natural and anthropogenic forcing has an effect on each of these different systems with analogous implications for marine systems elsewhere. Understanding these mechanisms is necessary for developing accurate models of the biogeochemical response of the oceans to (inter alia) changes in

atmospheric characteristics such as the Antarctic Circumpolar Wave (Southern Annular Mode) and Benguela Niños. The Southern Ocean is considered to be one of the two, North Atlantic being the other, most important ocean sinks of anthropogenic CO₂. However, the Southern Ocean remains one of the least sampled and understood ocean domains. The approach in this proposal is to train and educate South African Oceanographers and Students through joint research using a combination of observations and diagnostic modelling to understand the carbon biogeochemistry of the Antarctic and sub-Antarctic. Importantly, this approach builds on existing strengths within each of the collaborating groups. This initiative is contextualised within the IPY global effort. The proposed approach is to synthesise recent literature, re-analyse the data archives and to increase knowledge through observations from 2 project cruises. Subsequent data analysis will result in the production of scientific peer reviewed journals and 2 South African PhDs

17 Gobies and hake in the hypoxic waters of the Benguela up-welling current

Prosjektansvarlig:

Det matematisk-naturvitenskapelige fakultet, Universitetet i Bergen

Prosjektleder:

Palm, Anne Christine Utne Forsker

Prosjektnr: 180329/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **300,000** 2008: **250,000** 2009: **200,000**

2010: **105,000**

Responsible University/Institution, South Africa:

University of Western Cape

Principal Investigator, South Africa:

Gibbons, Mark Dr.

Financed by NRF:

2007: **233,000** 2008: **233,000** 2009: **284,000**

Our aim is to investigate how the goby (*Sufflogobius bibarbatus*) and the shallow water hake (*Merluccius capensis*) cope with the hypoxic waters of the Benguela current. Both are key species of the ecosystem. They show a remarkable tolerance to the hypoxic conditions found in this up-welling area, which is one of the five most productive marine ecosystems of the world. Due to high sedimentation rate, large areas of the shelf are covered with hydrogen sulphide sediments, making hypoxic conditions above and in the water column. As key species with strong influence on the ecosystem functioning and productivity, these species ought to have

evolved a very special physiology and behaviour making them so successful in this extreme marine environment.

We will use new acoustic methods (developed by Norwegian partners) to find individual hake and goby, and track their swimming patterns in the field. This method allows us to investigate (in the field) how the two species respond to changes in oxygen, sulphide and predator-prey conditions. To test our field generated hypotheses, we will conduct laboratory experiments where we will study their physiology and behaviour. Controlled experiments allow us to control water conditions (oxygen, sulphide levels), as well as to monitor the individual fish's swimming speed and activity level. Our research questions are based on pure, curiosity-driven research but they have applications for fisheries management. We will use an interdisciplinary approach wherein marine ecologists, environmental biologists, physiologists, fisheries biologists and behavioural ecologists will meet and work together. The new acoustic knowledge that the project will deliver may be a big step forward for the South African fisheries management institutions in their estimations of species abundance using acoustic techniques. Through the project we will provide common research opportunities for scientists and post graduate students in the South Africa and Norway

18 Characterization of the Mycobacterium tuberculosis phosphorylome and its role in pathogenesis

Prosjektansvarlig:

Det medisinsk-odontologiske fakultet, Universitetet i Bergen

Prosjektleder:

Wiker, Harald G. Professor

Prosjektnr: 180330/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-31.3.2010

2007: **218,500** 2008: **270,000** 2009: **261,000**

2010: **50,000**

Responsible University/Institution, South Africa:

University of Stellenbosch

Principal Investigator, South Africa:

Warren, Robin Mark Professor

Financed by NRF:

2007: **212,300** 2008: **287,100** 2009:

244,200 2010: **56,100**

Tuberculosis (TB) remains a major global public health concern. Approximately 2 million people die per year from TB, with South East Asia, Sub-Saharan Africa and Eastern Europe showing the highest levels of new cases and deaths. South Africa is one of the countries with the highest number of TB cases per capita. Recent advances in TB research have shown that the global TB epidemic is caused by many different variants of the causative agent *Mycobacterium tuberculosis*. Furthermore, research suggests that the properties of the different types of *M. tuberculosis* may have changed. These new forms of *M. tuberculosis* may be able to spread more rapidly, cause more disease, evade the effects of vaccination or reinfect individuals who have had a previous episode of TB. However, despite these advances in our understanding, the mechanisms underlying these different forms of *M. tuberculosis* remain to be determined. In this study we aim to determine whether the different forms of *M. tuberculosis* are caused by differences in the way proteins are modified. To our knowledge no study has been done to measure which of the *M. tuberculosis* proteins are modified and how this modification could change the proteins function. Furthermore it is not known whether the patterns of modification will change during different growth phases, during nutrient starvation, during hypoxia, and whether these patterns of modification will differ between the different forms of *M. tuberculosis*. Changes in the patterns of protein modification may provide novel insights into mechanisms regulating bacterial growth. Such information may enable the identification of pathways regulating latent infection, pathogenicity and virulence. These modified proteins will be important targets for the designs of novel anti-tuberculosis drugs and may be candidates for the design of new anti-tuberculosis vaccines.

19 Analysis and Possibility for Control of Atmospheric Boundary Layer Processes to Facilitate Adaptation to Environmental Changes

Prosjektansvarlig:

Nansen Senter for Fjernmåling, Stiftelsen

Prosjektleder:

Ezau, Igor Postdoktorstipendiat

Prosjektnr: 180343/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.9.2007-31.3.2010

2007: **105,000** 2008: **314,000** 2009: **294,000**

2010: **46,000**

Responsible University/Institution, South Africa:

University of Limpopo

Principal Investigator, South Africa:

Djolov, George, Professor

Financed by NRF:

2007: **207, 000** 2008: **227,700** 2009: **257, 400**

2010: **148, 500**

Convective rainfalls are of enormous importance for agriculture and water resource management in semi-arid areas such as Central-North-Eastern South Africa, where more than 50% of the country population is concentrated. This project will contribute into the redress and capacity development of the South African Universities in the area of micro-meteorology and adaptation to changing environment such as climate change or urbanization. This redress will be achieved through promotion of micro-meteorological education and research on the basis of the most recent advances in the theoretical understanding (non-local and roughness turbulence theories) and numerical modelling (large-eddy and non-hydrostatic simulations). The main beneficiaries will be historically disadvantaged and indigenes. The project will give to their representatives the necessarily knowledge, field equipment and inexpensive numerical tools to rational landscape planning to support sustainable agricultural and air quality management. Impossible without extensive collaboration, the project will link established international consortiums driving all necessarily research components and lead them to attack the convection and rainfall problem successfully. An absolutely novel, and thus risky, element of the project, is a study of possibility to control the micro-meteorological processes through rational landscape management. In the case of success, it may bring major benefits to humanity, in the third world where other means to improve environmental conditions could be too costly.

20 Integrated Health Information Systems for Public Health in South Africa

Responsible University/Institution, Norway :

Det matematisk-naturvitenskapelige fakultet, Universitetet i Oslo

Principal Investigator, Norway :

Braa, Jørn Førsteamanuensis

Project no: 180336/S50

Financed by RCN :

1.4.2007-31.3.2010

2007: **200,000** 2008: **200,000** 2009: **200,000**

Responsible University/Institution, South Africa:

University of Western Cape

Principal Investigator, South Africa:

Sanders, David

Financed by NRF:

2007: **400, 000** 2008: **400, 000** 2009: **400, 000**

This is a proposal for a multi-disciplinary research project involving the academic fields of public health and informatics that will link two universities in South Africa (University of Pretoria, Department of Informatics, and the University of Western Cape, School of Public Health), and the Department of Informatics at the University of Oslo, Norway. The interdisciplinary nature of this consortium is highly relevant to address research in two areas of health management information systems that are highly relevant in the current South African context, namely the integration of information systems across functional areas (e.g. integration of vertical programs such as nutrition and HIV/AIDS), and the integration of different types of data, namely: patient based data, statistical routine data and routine survey data (such as a waiting times and efficiency survey) in a single system.

We address three areas identified in the call for proposals, namely the health and medical sciences (with emphasis on mother and child health, public and community based health, preventative health and nutrition), HIV/AIDS (including non-clinical and multi-sectoral perspectives), and information and communication technology.

We propose two hypotheses, firstly that effective information systems (IS) and systematic use of information, and pragmatic perspectives on implementation of information systems will significantly increase quality, equity and accessibility of services. Secondly, that better integration of HIS across vertical programs and incorporation of routine surveys will significantly enhance the overall information system and the information available for each program. An action research methodology is proposed. An important consideration is the fact that the consortium already has a proven track record of experience and existing networks in the countries mentioned, and will thus quickly be able to scale up initiatives in support of the research agenda.

21 Industrial Applications of Metal Hydrides for Hydrogen Extraction, Storage and Compression

Prosjektansvarlig:

Institutt for energiteknikk - Kjeller

Prosjektleder:

Yartys, Volodymyr A. Professor 2

Prosjektnr: 180344/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **192,500** 2008: **192,500** 2009: **128,333**

2010: **164,167**

Responsible University/Institution, South Africa:

University of the Western Cape

Principal Investigator, South Africa:

Linkov, Vladimir Professor

Financed by NRF:

2007: **175,000** 2008: **175,000** 2009: **172,500**

Introducing hydrogen as universal environment-friendly energy carrier demands efficient technologies allowing to extract it from industrial streams (products of coal gasification, process gases of refineries, etc.), to store it by a compact and safe way, and, finally, to deliver H₂ to a consumer at high pressure. Metal hydride (MH) technology is a promising solution. However, its implementation requires new MH materials whose performances are not deteriorated in contaminated H₂. In addition, novel engineering solutions incorporating the materials into H extraction-purification-storage-compression system are in great demand.

This proposal is focused on the detailed study of advanced "low-temperature" H storage alloys (RE-containing AB₅; and Ti-containing AB and AB₂) and multiphase compositions on their basis.

Nanotechnological routes, including reactive mechanical alloying and forming the MH-carbon nanocomposites will be worked-out. Special attention will be paid to surface modification of the materials including deposition of thin metal films onto their particles, dosed surface oxidation and/or creation of oxide-modified hydride forming constituent phases. As a result, the MH materials characterised by high "poisoning" resistance, easy activation and fast H sorption / desorption kinetics will be developed. Furthermore, the experimental prototype of combined MH system for H₂ extraction/purification, storage and compression will be developed, including H₂ extraction/purification subsystem, H storage unit, as well as efficient MH H₂ compressor.

The work will combine the best efforts of the R&D communities in MH technologies including universities and academic institutions (IFE and NTNU in Norway; UWC in South Africa) and important industrial partners including Eskom (SA). 2 PhD students from SA will be educated

22 Prospecting probiotics and antimicrobials in

indigenous fermented milks for improved health

Prosjektansvarlig:

Universitetet for miljø- og biovitenskap

Prosjektleder:

Narvhus, Judith A. Førsteamanuensis

Prosjektnr: 180345/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **147,000** 2008: **251,000** 2009: **246,000**

2010: **79,000**

Responsible University/Institution, South Africa:

University of the Free State

Principal Investigator, South Africa:

Viljoen, Bennie C Professor

Financed by NRF:

2007: **283,020** 2008: **346,210** 2009: **335,530** 2010: **92,560**

The project will study various aspects of health-promoting organisms in indigenous fermented milk. Some probiotic lactic acid bacteria have great potential in the preparation of functional foods. Their potential health benefits include protection against infections caused by diarrhoeagenic microorganisms, use as an oral adjuvant and immunopotentiator in malnutrition. Their protective role may also be the result of competition with potentially harmful microorganisms. Additional health benefits include alleviation of problems of lactose intolerance in humans, increasing the peristaltic movement of parts of the digestive system, prevention and/or treatment of rotavirus and antibiotic induced diarrhoea, reduction in serum cholesterol, and reduction in hypertension. Many LAB also produce antimicrobial compounds (e.g. nisin) which can inhibit the growth of spoilage and/or pathogenic microorganisms in food, this providing a natural conservation of the food and protection of the consumer.

Selected microorganisms previously isolated and characterized during our collaborative program 200 which exhibit unique biochemical attributes as desired for specific applications in milk fermentations will be incorporated as starter cultures and probiotic agents. As these species are shown to have antagonistic effects against undesired pathogens and contaminants, they will be applied to promote health, and secure safe products for the communities. Positive species will be incorporated in scale-up methodology.

These novel ideas can also be applied to related industries, small scale farmers, communities in the rural areas and entrepreneurs in the implementation of new protective starter cultures and probiotics in fermented milk to improve present safety standards associated with

the production and processing of the milk. The significance of the study will be due to promotion of safe and wholesome products with extended shelf-life, based on indigenous food technology.

23 A Translational Effort to Develop Novel Magnetic Resonance Imaging Protocols and Sequences for Studying Myocardial Lethal Reperfusion Injury

Prosjektansvarlig:

Det medisinsk-odontologiske fakultet, Universitetet i Bergen

Prosjektleder:

Jonassen, Anne Kristine Førsteamanuensis

Prosjektnr: 180347/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-31.3.2010

2007: **250,000** 2008: **170,000** 2009: **286,300**

2010: **82,100**

Responsible University/Institution, South Africa:

UCT, Dept of Human Biology

Principal Investigator, South Africa:

Meintjes, Ernesta M.

Financed by NRF:

2007: **350,000** 2008: **430,000** 2009:

134,600 2010: **97,000**

Cardiovascular disease remains a leading cause of death worldwide. Impaired coronary circulation in the heart following a myocardial ischemic episode will lead to compromised hemodynamic function and ultimately cell death. Coronary reperfusion is the only means of limiting infarct size, provided that it occurs early after coronary occlusion, but may paradoxically directly result in tissue injury (lethal reperfusion injury). The management of patients with acute myocardial infarction (AMI) has improved dramatically with the widespread use of thrombolytic and antiplatelet therapy as well as mechanical disruption of the occlusive coronary thrombus or plaque. Even so, attention has turned to adjunctive pharmacologic treatments to enhance myocardial tolerance to ischemia/reperfusion induced stress. This strategy is being pursued in an attempt to further reduce mortality in patients undergoing reperfusion therapy. This project is part of a translational effort dedicated to the development of new therapeutic protocols for the identification and validation of novel therapeutic targets in the treatment of acute myocardial ischemia (AMI) and

reperfusion injury, in addition to development of novel MRI imaging protocols and sequences to be used in both clinical and experimental settings. The project will utilize state-of-the-art technologies in global gene expression analysis, retroviral vector RNAi technology, functional in vivo validation by inducible siRNA transgenic mouse model targeting candidate genes regulated by insulin therapy at reperfusion, and cardiac magnetic resonance imaging. Overall, this research program will provide greater insight into the genetic mechanisms orchestrating insulin pro-survival effects, providing new targets for therapeutic intervention in the context of ischemia/reperfusion injury in patients and implementation of more advanced and sensitive MRI protocols and sequences for studying progression of AMI in patients.

24 Springtail (Collembola) responses to changing, variable environments: a bi-polar approach linking individuals to ecosystems

Prosjektansvarlig:

Det matematisk-naturvitenskapelige fakultet, Universitetet i Oslo

Prosjektleder:

Leinaas, Hans Petter Professor

Prosjektnr: 180349/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **171,800** 2008: **165,500** 2009: **175,000**

2010: **41,400**

Responsible University/Institution, South Africa:

University of Stellenbosch

Principal Investigator, South Africa:

Chown, Stephen Professor

Financed by NRF:

2007: **292,607** 2008: **202,676** 2009:

237,976 2010: **84,365**

The aim of this project is to investigate the way in which environmental variation cascades up through life history variation to effect species- and assemblage-level responses to habitat fragmentation and climate change. It builds on observations that climate change and habitat fragmentation are two major threats to biodiversity, and on recent work demonstrating that predictability and variability are two components of environmental variation

that need to be clearly distinguished. The work will focus on a functionally significant group of soil animals, the springtails (Collembola), which are sufficiently circumscribed in their diversity to enable appropriate comparisons between different environments. Moreover, several of the species are common to virtually all of the sites owing to biological invasions in the southern hemisphere. The environments will include a southern sub-Antarctic site (Marion Island), a northern Arctic one (Svalbard), and two more temperate sites (in Scandinavia, and the Western Cape of South Africa). These sites differ substantially in the characteristics of their environments. The study will make use of both naturally (Marion, Svalbard) and artificially fragmented (Western Cape) landscapes to investigate the ways in which temperature effects on life histories might cascade up to influence responses to fragmentation. Specific goals of the study include investigations of widely held ideas about differences in phenology between the northern and southern hemisphere arthropods, and about the likely responses of soil organisms to habitat fragmentation. The project will also develop an inventory of springtails of the Western Cape Fynbos and will use genetic techniques coupled with traditional morphological systematics to identify and describe new species and make this knowledge accessible more broadly to ecologists.

25 Metagenomics and Gene Discovery in Antarctic Terrestrial Habitats

Prosjektansvarlig:

Det matematisk-naturvitenskapelige fakultet, Universitetet i Bergen

Prosjektleder:

Birkeland, Nils-Kåre Professor

Prosjektnr: 180352/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-31.3.2010

2007: **118,500** 2008: **245,000** 2009: **265,000**

2010: **125,000**

Responsible University/Institution, South Africa:

University of the Western Cape

Principal Investigator, South Africa:

Cowan, Donald Arthur Professor

Financed by NRF:

2007: **187,900** 2008: **271,650** 2009:

247,751 2010: **139,200**

We aim to use metagenomic methods to access portions of Antarctic low temperature crenarchaeotal genomes. Large insert metagenomic fosmid clones identified by colony hybridization with crenarchaeotal 16S rRNA gene

probes will be sequenced and ORFs identified. The design of probes to terminal regions of the positive clones can provide access to proximal sequences, allowing us to genome walk along the crenarchaeotal chromosome. Detailed bioinformatic analysis (particularly using COG databases) will allow us to infer the function of a proportion of the identified ORFs, from which we aim to derive information on physiological function. The long term aim of this project would be to use physiological information to guide the development of isolation strategies in order to access pure cultures of these recalcitrant organisms. Dr. Cowan's laboratory has a wide variety of source material from the Dry Valleys of Eastern Antarctica. These samples have been collected as part of an on-going research program on the diversity and function of microorganisms in the desert soils of the Antarctic Dry Valleys. Based on the metagenomic clones, we will also investigate the mechanisms of cold-adaptation of enzymes, using isocitrate dehydrogenase (IDH) as a model. This will shed light on how the organisms have adapted to the arctic environment. Furthermore, we intend to study the Cdc6 and MCM proteins from a variety of archaeal species identified in the libraries. This will broaden our knowledge about the mechanism of initiation of archaeal DNA replication. A comparative functional analysis as well as protein-protein and protein-DNA- interactions of purified Cdc6 and MCM proteins encoded on identical cloned fragments will be carried out. This will include studies on how Cdc6 stimulates or inhibits the helicase activity of MCM, and how they physically interact with each other. Finally, functional analyses using homologous replication origins will be pursued.

26 Nutritional intervention and novel diagnostics to improve community-based control of tuberculosis

Prosjektansvarlig:

Det medisinsk-odontologiske fakultet, Universitetet i Bergen

Prosjektleder:

Grewal, Harleen Professor

Prosjektnr: 180353/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **61,000** 2008: **105,000** 2009: **26,000** 2010: **98,000**

Responsible University/Institution, South Africa:

University of the Western Cape

Principal Investigator, South Africa:

Swart, Rina Dr.

Financed by NRF:

2007: **390, 000** 2008: **284, 000** 2009:
279, 000 2010: **112, 000**

Tuberculosis (TB) is a major public health problem in developing countries as well as in the Republic of South Africa (RSA). Despite significant strides in case detection and treatment, the prevalence of TB continues to rise at an alarming, also in the RSA. More effective diagnostic methods are required as early diagnosis is the cornerstone of effective TB control. The inexpensive standard Mantoux skin test which is currently used to identify TB suffers from poor specificity and poor positive predictive value (PPV) because the antigens are present in environmental bacteria as well as in the BCG vaccine. The ESAT-6 antigens are specific for Mycobacterium tuberculosis (M.tb), the causative agent of TB. New blood-based in vitro IFN-gamma release assays (IGRAs), based on ESAT-6 antigens, are more specific than the Mantoux skin test and have shown to have enhanced sensitivity in diagnosing active TB disease in HIV-infected and malnourished HIV-infected children. We hereby propose to evaluate the diagnostic value and utility of the new ESAT-6-based IGRAs to detect M.tb infection and predict TB disease in HIV-infected and uninfected South African children.

TB drugs are often administered to malnourished individuals, despite the fact that specific micronutrient deficiencies may negatively affect drug kinetics, decrease their efficacy and increase their toxicity. A randomised controlled trial will assess the effect of adjunctive micronutrient supplementation, administered as part of the established Directly Observed Treatment Short-course (DOTS), on treatment outcome among pulmonary TB patients. Depending on the magnitude and range of effects, the data from this trial could lead to national and international policy recommendations to include micronutrient supplementation as an adjunct to standard anti-TB treatment.

27 ICT and poverty - a community-based user approach

Prosjektansvarlig:

Norsk institutt for by- og regionforskning

Prosjektleder:

Braathen, Einar Forsker 2

Prosjektnr: 180354/S50

Bevilgningsperiode og finansiering fra Norges forskningsråd:

1.4.2007-30.9.2010

2007: **300,000** 2008: **300,000** 2009: **200,000**
2010: **122,600**

Responsible University/Institution, South Africa:

University of the KwaZulu-Natal

Principal Investigator, South Africa:

May, Julian Director

Financed by NRF:

2007: **299, 200** 2008:**233, 200** 2009:**365, 200**

The digital challenges ahead for a country like South Africa can be met with different types of action. So far the emphasis has been on increased fixed line and mobile telephony access for disadvantaged communities. There are two major concerns :

1. The efforts have been mainly carried out in supply-led and top down ways either by the government or market operators.
2. There has been no successful drive towards increased public access to computer use and internet.

The data will be collected with a quasi-experimental approach . Using similar quantitative and qualitative data gathering techniques, and a panel study design, the objective is to provide measurable evidence on the impact of ICTs on the reduction of poverty. The approach embodies 4 stages:

- I. A baseline study of selected groups in selected communities;
- II. A participatory learning process with the groups, resulting in the design of the subsequent (intervention) stage
- III. An intervention designed to accelerate the use of ICTs among groups in some of these communities which will be randomly selected as a 'treatment' group, while delaying the provision of this training by one year for the 'control' group;
- IV. An impact study - second wave of data collection. Impacts of the interventions on digital poverty as well as of ICT usage on the wider dimensions of poverty will be analysed.