**Minutes of RATZOOMAN inception workshop held at the Natural Resources Institute**

The following people were in attendance at the meeting:-

Lorraine Arntzen, NHLS
Steve Belmain, NRI - technical co-ordinator
Nan Chalmers, SZ
Philip Davies, NRinternational - financial co-ordinator
John Frean, NHLS
Amy Guyatt, NRI
Rudy Hartskeerl, KIT
John Holt, NRI
Malcolm Iles, NRI
Monica Janowski, NRI
Herwig Leirs, DPIL and RUCA
Robert Machang'u, SPMC
Cammy Marchant, NRI
Martha Mpisaunga, SZ
Rassul Nala, INS
Linda Nicolaides, NRI
Judith Pender, NRI
Guy Poulter, NRI

The Director of NRI, Dr Guy Poulter, gave a brief introduction to NRI and invited consortium partners to contact him in the future to discuss existing activities of NRI or potential new areas for collaboration with NRI. E-mail: R.G.Poulter@gre.ac.uk

Project partners discussed common financial issues and then began to systematically discuss each workpackage and plan the activities in detail for the remaining time available over the next few days of the workshop.

**Project Finance**

Financial issues were discussed by Philip Davies, Cammy Marchant and Amy Guyatt. Reporting requirements were described. **Priority**: It was agreed that draft financial forms are completed by all consortium partners by the 1st November 2003 and circulated to the co-ordinator so that any outstanding issues can be resolved. This will ensure a timely submission of the reports at the end of December and help minimise delays in the transfer of the next payment to consortium partners by the EC. **Priority**: It was agreed to investigate the possibility of covering financial shortfalls in advance payments to DC countries, particularly with regard to the final payment after project completion, but this will need to be considered on a case by case basis. **Priority**: DC countries to get subcontractors in order, subcontracts signed up and budgets set. DC partners to inform Steve of names of subcontractors and their indicated budgets so that he can decide whether it is necessary to inform the EC for their approval. This must be done by the 30th April.

**Workpackage 1: Retrospective and prospective investigation of human sera**

Discussions focussed on three issues: the availability of sera, the analysis techniques to be used, and the collection of samples and data. Historical sera banks are not always common in target countries and some DC partners expressed doubt that significant banked material will be available outside major cities. Other sources of banked sera such as blood banks, other disease screening projects (e.g. malaria, HIV) could also be used, and DC partners will investigate the prospects in their own countries. Access to banked sera, when available, should not be a problem but will require considerable administrative efforts to gain clearance. There will be variable problems associated with the level of information provided with sera samples from different sources. The consortium agreed that retrospective analysis will largely have to work within the existing systems in each country and try to gain as much information as is possible from existing sera stocks. In most cases banked sera will need to be analysed for the target diseases at location, the implication being that training and finance of appropriate analysis will need to be given by the consortium to appropriate hospital staff. **Priority**: DC partners to identify all sources of sera that could be used for testing and find ways to facilitate their analysis for leptospirosis, toxoplasmosis and plague. A deadline of one month after the meeting (April 18th) to present initial plans was agreed.

Prospective analysis will need to initially rely on hospitals in project focal areas. As many hospitals may not routinely save sera after analysis, DC partners may need to formalise arrangements for hospitals to save sera for a period of time to facilitate their analysis for zoonotics. All DC partners agreed that it would be difficult to gain access to non-clinical sources of sera. However, efforts should be made to fully involve target communities in focal areas through repeated meetings to facilitate the collection of sera in focal areas. **Priority**: DC partners to select one major and two minor focal towns for project activities in each country. Where possible these areas should have active zoonosis and/or some historical data on the presence of zoonotic disease. These focal areas will also be used for all other workpackage activities. **Priority**: DC partners to contact local hospitals in catchment of focal areas for involvement in prospective serological analysis for zoonotic incidence. A deadline of one month after the meeting (April 18th) to present initial plans was agreed.

The types of analytical techniques for each disease were agreed. RAPID tests exist for leptospirosis and toxoplasmosis for human sera. MAT will need to be used for leptospirosis in rodents and other animals and for confirmation of human samples. It is possible that the toxoplasmosis kit can be adapted for use in other animals or that such kits already exist, particularly in cats. For plague, ELISA is available for humans and can be adapted for rodents and other animals. Culturing of leptospires will be necessary where possible. Supplies from rodents will be facilitated from other workpackages. Culturing leptospires from domestic animals poses more problems. For this, access to slaughterhouses was discussed as well as urine collection through catheter and bladder tap or using furosemide to induce urination. **Priority**: NRI to contact Organon Teknika (or BioMerieux) regarding IgM and IgG toxo microelisa kits as well as their lepto DriDot tests and forward on information to consortium partners. **Priority**: DC countries to liase with each other to establish whether a discount for kits can be obtained by buying for the requirements of all four countries together.

**Workpackage 2: Taxonomic identification of rodent species**

Discussions focussed on the types of trials and procedures required to collect information about rodents found in rural, peri-urban and urban areas. It was agreed that ten habitats would be selected for trapping in the main focal area in each DC country. To trap in all ten habitats requires 560 traps. Each habitat trap line will be trapped over four nights, meaning that all the habitats can be broken into portions over a number of weeks, thereby reducing the number of traps required by rotating the traps to different places in the focal area. In each habitat trap line, one half of the traps should be Sherman traps, one quarter should be snap traps, and one quarter should be larger cage traps or other indigenously designed traps. The way in which rodents should be collected, labelled and which tissue samples to take was agreed. Surveys will occur every three months during the first 12 months giving four survey times, with the possibility of two further subsequent surveys in year two. The details of the procedures involved will be sent separately to consortium partners. **Priority**: RUCA to circulate data collection protocols to all partners. **Priority**: DC countries to start sourcing and buying traps. Depending on how habitat trapping is rotated in each survey, each country will need roughly 150 Sherman traps, 75 snap traps and 75 other types of traps. Trial management should liase with WP4 as 200 more Sherman traps are required here.

**Workpackage 3: Isolation of zoonotics from animals**

For rodents, tissue (liver, kidney, spleen, heart, lung - details to be circulated separately) and blood samples will be taken from animals trapped in WP2. It was not clear whether it would be necessary to culture Toxoplasma and further investigation will be made and whether this would impact on the sample collection protocols. Leptospira will be routinely cultured; however, it was agreed that Yersinia would not be cultured with analysis relying on serological and PCR methods. It was agreed that domestic animal sera should be sampled in the focal areas, particularly, dogs, cats, pigs and goats. Close involvement of the community will be necessary for such sampling to occur. Although difficult, collection of urine from domestic animals remains an option to determine presence of Leptospira. **Priority**: NHLS to search for optimal toxoplasmosis analysis protocols and inform consortium whether brain tissue should be maintained for culturing or PCR. **Priority**: DC partners to start discussions with focal area communities on the screening of domestic animals.

**Workpackage 4: Rodent ecology**

The main activity will be to conduct a capture, mark, recapture (CMR) in the main focal area in each DC country. This will be done with a grid of 100 Sherman traps placed in two separate fields on the outskirts of the town where staple crops are grown. The important issue is to ensure that the trapping grid lies half within a cropping area with the other half lying over an uncultivated area (bush or fallow).

Captured small mammals will be toe marked and released so it is important that the farmer or community understands and supports the reasons for conducting this trial. Other trials to understand rodent movements between different habitats in the environment involving the use of marked baits and radio telemetry will be discussed at a later time. **Priority**: DPIL to circulate detailed CMR trial protocol. **Priority**: DC partners to identify two sites at main focal area and gain permission for study to run.

**Workpackage 5: Impact of environmental factors**
Activities are linked with other workpackages under three main areas GIS, anthropology and disease transmission specifically related to water management and land use. GIS will be used to look at broad changes in the DC countries as well as in more detail within the specific localities chosen in each country. Historical images will be used to analyse for changes in land and water usage. Communities within focal areas will be targetted for in-depth surveys to understand changes in cropping patterns, urban growth, water management over time looking for areas of anthropogenic change. It was agreed that point water sources and food within households, markets and stores should be assessed for general rodent contamination as well as presence of leptospires, particularly when samples have been obviously contaminated. The susceptibility of water and food to be contaminated will be investigated and the principles of HACCP applied to the food chain to analyse the critical control points in the food processing systems. pH of water sources, including surface waters as well as their 'quality' to be routinely screened. Social scientists will need to register human activities like swimming, washing, drinking, in different water sources. pH of soil measured and moisture of soil through the seasons (notably at catching times) described. Daily rainfall registered and incorporated into GIS to assess heavy rainfall via swollen rivers. **Priority**: Ricardo Thompson from INS to visit the UK as soon as possible to meet with Judith Pender from NRI to discuss GIS data collection. Ricardo and Judith to agree dates for following meeting in Maputo. **Priority**: DC countries to identify institutions and individuals to be involved in social science studies and liase with NRI social science staff to prepare visits to DC countries and start surveys. **Priority**: NRI and KIT to work out sampling protocols for water and food analysis and challenge experiments.

**Workpackage 6: Socio-economic impact**
A number of survey tools, both qualitative and quantitative, will be used to measure the knowledge, attitudes and practice of different members of target communities with regard to the zoonosis and rodents as well as the economic impact the diseases and rodents have upon people's livelihoods. It was agreed that these are best developed in collaboration with local social scientists and with activities in WP5 and WP7. Surveys should concentrate on plague endemic areas of Mozambique and Tanzania to gain an understanding of this disease. Leptospirosis and toxoplasmosis will be studied in all four DC countries. **Priority**: DC countries to identify institutions and individuals to be involved in social science studies and liaise with NRI social science staff to prepare visits to DC countries and start surveys.

**Workpackage 7: Anthropogenic change**
Human intervention in the environment could increase or reduce the chance of disease spread and/or acquiring zoonosis and qualitative and possibly also quantitative studies are required to understand many of these issues. As above, the survey methods and activities will be developed in collaboration with social scientists in each of the DC countries. **Priority**: DC countries to identify institutions and individuals to be involved in social science studies and liaise with NRI social science staff to prepare visits to DC countries and start surveys. **Priority**: Steve to draft up key issues we believe influence spread of the three key diseases in environment, rodents and people, and descriptions of symptoms of the diseases in key species and in people, and circulate.

**Workpackage 8: GIS**
Everyone in agreement on the general analysis looking for broad changes over large areas and more detailed information collected for targetted focal areas in each DC country. Current aerial maps could be important for detailed study, but unsure of cost implications to obtain such maps for each focal area. SPOT, SADC and LANDSAT images to be obtained and other sources of map information to be collected. **Priority**: DC countries to investigate costs of local hire of aeroplanes, Judith to make enquiries with collaborators in South Africa on the prospects of aerial map photography. **Priority**: Everyone to liase with Judith and Ricardo over databases that will be created in other work packages. This is important to iron out issues of importing data into GIS system. **Priority**: Judith and Ricardo to meet ASAP initially in UK to iron out all GIS details. **Priority**: DC countries to locate weather stations

nearest to focal localities. **Priority**: DC countries to purchase a GPS (if they don't have one already) for use in increasing accuracy of GIS.

**Workpackage 9: Modelling**
Important to establish which factors are important and their magnitude in order to develop predictive models. Most parameter values are to be covered in previous workpackages. It was highlighted that little information on the infection rate of humans contracting zoonosis would be collected but that this could be estimated as could the infection rate of rodents for which limited data may be available. **Priority**: Everyone to keep John Holt informed of the types of data to be collected and to pass data to him as collected. **Priority**: NRI to liase with DPIL and SPMC over existing rodent population data in Tanzania.

**Workpackage 10: Development of disease management strategies**
Little to say about this now as will be built on information collected in earlier stages of the project. Strategies could be very simple and related to minor changes in human practice (e.g. water storage) or related to rodent management by reducing the carrying capacity of the environment or targetted rodent population control measures. Important to collect disease prevalence data before and after strategy implementation to show strategy was effective and to inform and modify predictive model. **Priority**: Everyone to be aware that this workpackage depends on collecting and analysing data in previous workpackages. It is, therefore, essential to keep to our timeline of activities as closely as possible.

**Workpackage 11: Policy issues**
Role of rodents in disease transmission does not register among DC country governments and aid donors and must be put in context of other human health impacts in DC countries (HIV, malaria). **Priority**: DC countries to inform workpackage leader, SZ, of important contacts in their own countries. For example, people at Ministries or Departments of Health, Health Ministers, organisations strongly active in provision of health services, implementation of disease control, other disease programmes such as malaria, dengue. **Priority**: SZ to carry out background research on current understanding of zoonosis under different DC country policies by liasing with other DC countries. **Priority**: All consortium partners to try to raise the profile of our work and the ratzooman project with appropriate policy makers in their own countries.

**Workpackage 12: Stakeholder workshop**
This should happen in early November 2005 to avoid Christmas and give time for workshop results to be incorporated into final project report. **Priority**: NHLS to think about fixing the dates for this meeting now and compiling a list of the broad types and numbers of each that should attend the meeting (without naming names). **Priority**: Consortium to consider additional funding for attendees' travel and subsistence costs through the CTA or EU. Co-ordinator find out and circulate appropriate applications for consideration.

**Workpackage 13: Output dissemination**
Details of ratzooman project will be updated on IPMEurope website:
http://www.nri.org/IPME/rodents.htm
(I've just noticed a few errors on this which should be corrected shortly)
**Priority**: Everyone to please make links to this site on websites that you and your institutions maintain. Everyone to inform project co-ordinator of information that should be added to ratzooman webpages.

Future co-ordination meetings will be used to discuss opportunities to publish research targetted for different audiences. **Priority**: All consortium partners to investigate publishing brief summaries of the project in local newspapers, radio, institutional newsletters, etc. within the next two months to raise awareness of the project in their own country.

**Dates of next meetings**
Week of 21 July 2003 at Morogoro, Tanzania. This is more of a training meeting so it is not essential that all EU partners attend. Common methodologies related to rodent trapping, tissue and blood sample taking, preparation of rodent specimens, handling rodents, recording data, etc. will be covered. It makes sense that the key people involved in these activities attend the meeting. You may, therefore, wish to be accompanied by one of your subcontractors, if appropriate, bearing in mind

whomever attends this meeting will be required to train others on their return to their respective countries. Also please remember that the week before (14-18 July) the ratzooman meeting is the African Small Mammal Conference in Morogoro where many talks on rodents will be given which you may find useful to attend. The conference website is: http://www.dpil.dk/asms/

Week of 2 February 2004 at Maputo, Mozambique - agreed and confirmed at meeting
Week of 20 September 2004 at Kings Lyngby, Denmark??
Early April 2005 at Harare, Zimbabwe??
Early September 2005 at Amsterdam, the Netherlands??
Early November 2005 at Johannesburg, South Africa for end of project stakeholder workshop

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**Title : Prevention of sanitary risks linked to rodents at the rural/peri-urban interface**

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