

New School of Dentistry 1

University Development
and Economy 2-3

The Kapsabet School
of the Deaf Project4
Philosophy, Vision, Mission,
Goals and Objectives5

Visitations 2007/085

10 Years SUPPORT AFRICA6

Honorable members and
friends of SUPPORT AFRICA6

Award Programs
Award Winners 2005/20077

Flies and human health in
sub-Saharan Africa 8-11

Award Calls 2008
Foundation Stone Laying12

Foundation Stone Laying Ceremony at Moi University, Kenya

The Department of Chemistry at the School of Natural Sciences of Moi University was able to lay the foundation stone for its new building on Nov. 9, 2007. Prof. Dr. B. Pfeiffer of SUPPORT AFRICA INTERNATIONAL (SAI) was invited to officiate in this ceremony. The construction has been finished in the meantime. The new home of the Chemistry Department is located on a natural side on Chepkoilel Campus of Moi University.

The co-operation between the Department of Chemistry and SAI goes back to the year 2002, when a co-operation agreement was signed between the two organisations and the University of Applied Science of Merseburg, Germany. In the meantime the Department of Chemistry received a donation of a chemistry laboratory from the University in Merseburg which SAI forwarded to the new owner in two containers. The costs for the logistics was co-financed by the German government (GTZ) and SAI. The co-operation between the two universities was deepened in the years to follow through a joint research project in the field of biological water purification, a research, which was directed at the Department of Organic and Ecological Chemistry at University of Applied Sciences by Prof. Dr. Regina Walter and at the Department of Chemistry at Moi University by Prof. Dr. Paul Ndalut. This co-operation included also an exchange of teaching personnel and students.

Award Calls 2008

SUPPORT AFRICA INTERNATIONAL
is offering the

Heinz und Johannes Weigmann RESEARCH AWARD 2008 FOR ECOLOGY

Scientists in the field of ecology and related sciences at sub-Saharan universities are invited to submit research papers (no project proposals) on the topic:

CLIMATE CHANGE IN SUB-SAHARAN AFRICA, OBSERVATIONS, PROBLEMS AND SOLUTIONS

Date of submission: August 31, 2008 (date of postage)
Length of paper: double space, 20 pages
Language: English
Address: SUPPORT AFRICA INTERNATIONAL
Alte Str. 19, 56357 Berg/Taunus, Germany
e-mail: info@support-africa.de

SUPPORT AFRICA INTERNATIONAL
in cooperation with the Schweisfurth Foundation
is offering the

RESEARCH AWARD 2008 FOR SUSTAINABLE AGRICULTURE

Scientists in the field of agriculture, horticulture, biology, nutrition and related sciences at sub-Saharan universities are invited to submit research papers (no project proposals) on the topic:

NEW NON-ANIMAL PROTEIN PRODUCTS FOR HUMAN CONSUMPTION IN SUB-SAHARAN AFRICA

Date of submission: August 31, 2008
Length of paper: double space, 20 pages
Language: English
Address: SUPPORT AFRICA INTERNATIONAL
Alte Str. 19, 56357 Berg/Taunus, Germany
e-mail: info@support-africa.de

SUPPORT AFRICA INTERNATIONAL
in cooperation with the International Institute for Applied Cooperation
and Conflict Investigation (IVAT)
is offering the

RESEARCH AWARD 2008 FOR INCLUSIVE EDUCATION

Scientists in the field of education, social and related sciences at sub-Saharan universities are invited to submit research papers (no project proposals) on the topic:

INCLUSIVE EDUCATION IN SUB-SAHARAN AFRICA: PROBLEMS, EXPERIENCES AND SOLUTIONS

Date of submission: August 31, 2008
Length of paper: double space, 20 pages
Language: English
Address: SUPPORT AFRICA INTERNATIONAL
Alte Str. 19, 56357 Berg/Taunus, Germany
e-mail: info@support-africa.de

RESEARCH AND DEVELOPMENT

IN SUB-SAHARAN AFRICA

2008/1

UT SCIENTIIS
ILLUMINENTUR GENTES AFRICAE

New School of Dentistry Inaugurated at Moi University, Kenya

Moi University inaugurated the new School of Dentistry on November 9, 2007. This is the third dental school in Eastern Africa serving together about 300 Million people. The preparation activities for the opening had spread over several years until the charter was available, the faculty nominated, and the equipment made available. Dr. Caroline Kibosia serves as its first academic dean.

The new School of Dentistry had invited a number of special guests for its opening ceremony, among them the Chancellor of Moi University, Prof. Dr. Bethwel A. Ogot, the Dean of the School of Dentistry of Indiana University (IUPU), Prof. Dr. Larry Goldblatt and Dorothee Grebe and Prof. Dr. B. Pfeiffer of SUPPORT AFRICA INTERNATIONAL (SAI). The Vice-Chancellor of Moi University, Prof. Dr. Richard K. Mibey, in his celebration speech stressed the importance universities have in serving their constituencies. From this point of view it was encouraging to note how a young university is planning and implementing its academic program in such a way that its community is also served. This celebration also was for SAI a very challenging moment, having been instrumental in obtaining the dental equipment and instruments on behalf of the university already in 2004. Even though it had taken some years to open the new school, it proves again universities given the challenge and sufficient time, medical projects can be implemented successfully promoting the university academically and serving the needs of the people at the same time.



The first 15 students admitted to the new School of Dentistry.



Dental chair supplied by
SUPPORT AFRICA INTERNATIONAL



Chancellor of
Moi University,
Prof. Dr. Bethwel A. Ogot
opening the new School
of Dentistry.



Prof. Dr. Larry Goldblatt,
Indiana University (IUPU)

University Development and Economy

Prof. Dr. B. Pfeiffer
Excerpts of a lecture given at Moi University, Nov. 9, 2007.

In general, European and western universities are embedded in cities or nearby suburbs where in close symbiosis with their hosts a continuous growth and development is ensured, both through public services and government funding. Due to this expansion process, which sometimes lasted over several centuries, universities eventually spread their faculties over the cities, where ever plots or land was available. Sometimes, even faculties were scattered over various locations so that departments, seminars, and research centers were not always hosted within the same building. Students lived in rented student living quarters or in private homes wherever rooms were available. Thanks to a functioning infrastructure, universities developed progressively under this system which only changed in modern times when new mammoth campuses were clustered in nearby suburbs, where to date thousands of students are enrolled and reside.

This type of university development as described above differentiates to some extent to the development experienced by sub-Saharan African universities. Those founded during colonial times are still operating down town in some major cities, where they formally served as mission or public schools. However, the vast majority of modern African university campuses must be searched for far off in the outskirts of towns or even in the distant country side. Wisely enough, most of them settled in rural areas where land was still available for present and future expansions.

Not all new African universities were built from scratch. Some moved into empty installations such as military, research, or school centers. Starting up a university within a city was not reasonable, because of uncertain availability of infrastructural resources such as housing, water, power, and sewage systems. Consequently, the move into "empty space" was of great advantage for future developments, yet, beside the academic work it necessitated substantial investments for creating the physical infrastructure. Therefore, starting an African campus university proved to be an expensive and difficult undertaking. Even by receiving a land donation from the state, the remaining tasks were still a major challenge.

Infrastructures of main importance are: Provisions for water and electricity, disposal of waste water, easy access to roads, socio-economic services, and markets. African universities report a tremendous increase in an annual student growth up to 10%.

Therefore, top priority must be given to the expanding student body. For this reason a comprehensive development plan focused on the economic infrastructure is crucial for any successful present and future development. Such a procedure, as suggested, may be followed step by step within the four stages described below:

1. University budget based on tuition and fees
2. University budget based on an internal economic system
3. University budget based on industrial and communal activities
4. University budget derived from investments and shares

1. University budget based on tuition and fees

Most sub-Saharan African universities started under this classical economic system and remained there under. At the time of founding older installations were turned over for university build-up, or universities were built by the help of grants but afterwards left alone in financing any further development. The consequences thereby can be easily detected when visiting some of those campuses. Some appear deteriorated and run down due to insufficient finances. Anyway, insufficient financial support forced universities in generating investment funds by themselves.

Typical for the classical budgetary system is the reliance on tuition and fees only, which is common practice among private and public universities, thereby financing faculty and staff, the up-keep of buildings and campuses, but also any further developments.

It is not surprising that universities drastically increased their student bodies in order to balance the budget. Of course, it is very difficult to expand academically and raise academic standards under such conditions. Research laboratories, libraries, and institutes cannot be expanded as fast as the student body enrollment increases, which often means, that the academic work is likely limited to teaching and literary work. This difficult situation can be overcome, if sub-Saharan African universities receive massive assistance. Support for universities can be targeted both, through financial and/or material support by private or public assistance to the point of self-sufficiency and through supplementing of the tuition-and-fees-based economic system. Furthermore, government regulations and laws must stipulate universities as authorized receivers of

national and international donations - tax and customs free. The annual donations needed must be estimated of several million Euros. Unless this is granted, sub-Saharan African universities cannot compete with their western counterparts.

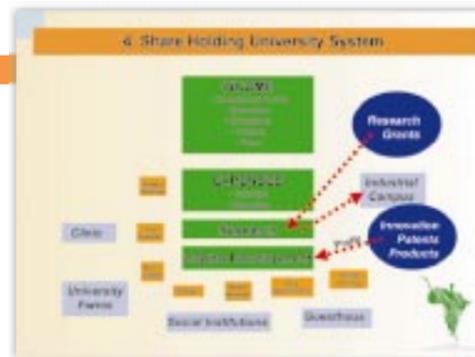
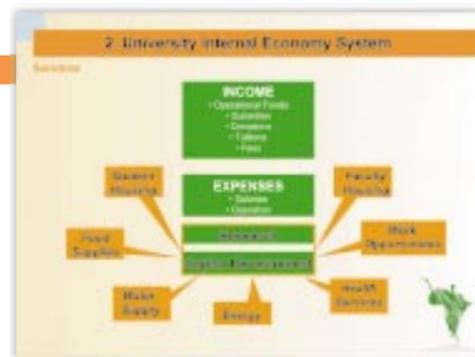
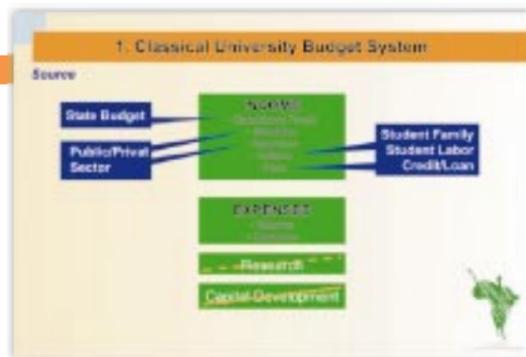
2. University budget based on an internal economic system

Newly founded universities, basically relying on undependable private and public subsidies and following the above mentioned classical tuition-and-fees-based system, fail to recognize the advantages gained by developing an internal economic system. This may have resulted from disinterest by exclusively focusing on academic excellence or other budgetary priorities. This leads to handing out campus services to investors.

Difficulties arise in keeping pace with the demands of the tremendous growth of student and faculty bodies. In order to ease the infrastructural demands, universities call upon private investors for providing housing in off-campus-sceneries. This results very often in wild and uncontrolled suburb developments not based on proper city development plans and physical infrastructure, which bear all the disadvantages of insufficient water and power supplies, lack of sewage systems, poor roads, and all the social problems eventually arising thereof.

Though this approach may exempt a university from heavy investments, on the long run there will be a financial loss of income derived from rents and other services such as water, food and power supplies. Universities who follow a faculty and student housing strategy prove to have their campuses in a much better shape while generating more capital investments.

The same principle also applies regarding energy provisions. The constant energy cuts and shortages of municipal providers necessitate obviously self-supporting facilities. University administrators often shrink back in view of the heavy investments involved, and this even more so in the case of refining drinking water and managing waste water. But these problems can all be solved financially, especially, if embedded within an ecological frame work as being very successfully demonstrated by Valley View University, Ghana, - the first ecological university campus in sub-Sahara Africa (Research and Development, 2007, p. 1-3, 2006).



Finally, universities should not shrink from generating food supply to students and families involved as part of the rapidly growing university population and the surrounding community, which includes university-run vegetable gardens, farms, food productions, and cafeterias. Facing the fact that students are continually in need of employment and income, opportunities for employment in these areas are more than welcome. Also the universities budgeted based on an internal economic system is stabilized and accelerated by the increase of capital at the same time.

Therefore, the solution to the financial problems of sub-Saharan African universities is to supplement their budgets by establishing a proper internal economic system and management planning. If university auxiliary services are well organized, they are contributing valuable incentives to the academic development rather than being a hindrance. As long as African universities cannot depend on continual flow of state and private funding, the development of the budgeted based on internal economic system is a potential asset in capital building in addition to the income from fees and tuitions. This is the second stage suggested above for maintaining any successful university development.

3. University budget based on industrial and communal services

When states, communities or business sectors fail in ensuring and fostering sustainable investments or industries, universities should grasp the opportunity for innovative leadership in these areas. Thereby they not only solve their own financial problems but also support the surrounding communities aspiring to higher standards of living. At first sight this opinion may seem strange and out of place of university responsibilities. However, to date the matter of course as practiced in modern societies is when industries are developed and managed by professors and graduates. As initiators or share holders in companies, as providers of patents, and innovations stimulating industrialization, they contribute their expert knowledge and experience. Though these activities also were previously not considered as part of the university assignments, they prove to be a potential outreach for any community oriented university in stimulating industrial developments. Also in China, Korea, and the Philippines, universities are strongly supporting the rapid development of their industrial and science-bound societies.

African universities south of the Sahara have to catch up on these developments, which could change sub-Saharan Africa in a short time. The following sciences are mentioned as fitting examples. There are the faculties of agriculture who could demonstrate their know-how not only on departmental experimental fields but also on university-owned and university-run farms. Up to date there are by far too little activities in this area.

Furthermore it is encouraging to note how universities have taken measures to open medical schools. Despite the lack of financial resources, some have already completed the preparatory work by enlarging their small day-clinics step by step for becoming qualified university clinics. If this development process continues, there will be quite a number of new sub-Saharan African medical schools and clinics in operation. SUPPORT AFRICA INTERNATIONAL, a NGO, which carries out projects and programs also in university clinic development, is extending a helping hand in promoting programs like this as much as possible.

The same principle also applies to faculties of social sciences in establishing and maintaining social institutions, where advice and knowhow is needed. They are not as much involved in applied social work, separating academic activities from practical application. Of course social institutions absorb a lot of funds, however, if properly developed and managed, they would become self-sufficient, foster student labor, and provide practical training for students.

Finally, universities involvement in small enterprises and industries is also an integral part of the university budgeted based on industrial and communal services. If foreign investors are not to dominate the African markets, universities must also be ready to face this challenge.

The output of new discoveries in biochemistry, pharmacology, technology, and natural resources open new avenues for production and marketing. Many secrets, still to be discovered in the rain forest the store house of African knowledge, are valuable resources for production and economic development. It is encouraging to see how university administrators and professors are more and more interested in initiating the production of their discoveries.

Also the natural environment in Africa offers many secrets to be disclosed which in joint and

innovative efforts taken by African universities reveal their wealth to the people. There is an urgent need to utilize the natural resources for production and marketing to satisfy the local market and the needs of the people.

4. University budgets derived from investments and shares

When a university has passed its first and second generation, the following budget based tasks have been accomplished, the consolidation of fees and tuition, the functioning of the internal economic system, and the operation of industrial and communal services.

Now, in the 4th stage as suggested in this paper, university budgets are coming to its climax. Research is promoting discoveries and innovations which are ending up in production. Due to this development additional funds and shares are generated.

Probably universities may not have the capacity of running the production independently, however, they are to take responsibility for ensuring discoveries to be properly patented and their participation in investments and shares are guaranteed. Also at this stage intellectual property rights regulations have to be established in order to stipulate and secure the rights of the inventors and the university by providing the research facilities.

Universities in sub-Saharan Africa still have a long way to go in this process. Too many efforts are invested in teaching while research is regrettably neglected by lack of adequate research facilities. Therefore, to achieve this developmental goal small steps have to be taken to update facilities and equipment making research results possible. With private or public assistance this goal is within reach.

Experiences in sub-Saharan African university development reveal that the processes here described can be achieved if only the goal is clear. Due to economic shortcomings it is not easy to skip the steps mentioned. The evolution of these steps must somehow be followed. One cannot just start with the last one. However, it is not a law to be strictly followed in this order. Naturally a number of overlapping happen and one may not be aware of these processes while in action. But in following this system to some extent, the development of a university becomes easier and understandable.



Kapsabet Vocational Training School



The deaf carrying their water

Inclusive Education

The Kapsabet School of the Deaf Project

Beside scientific research promoted at African universities south of the Sahara in connection with an award in inclusive education, SUPPORT AFRICA INTERNATIONAL (SAI) also fosters projects in this area. In this issue we like to report about our experience of implementing a vocational training school at the Kapsabet School of the Deaf in Kenya, a boarding school admitting 120 pupils up to grade 8.

This school was established in 1999 as a government institution, also supported by various Kenyan churches. These deaf had the opportunity of receiving a legally guaranteed elementary education, though after graduation they found themselves with little or no chance of becoming employed. Consequently, the challenge to the board and administration was to find a way to lead the deaf also to a profession, preparing them for live and economic independence. After lengthy discussions, the school finally arrived at the conviction, that a three years vocational training school had to be urgently established in addition to the present educational program.

On the whole SAI is not running development projects outside university education, yet the NGO was still willing to pick up this challenge within a wider frame that on one side involved consulting on the part of a university, and on the other the implementation of inclusive education on the secondary level. The implementation of this combination was made easier due to the fact that it was proposed by the former Vice Chancellor of the nearby University of Eastern Africa, Prof. Dr. Mutuku Mutinga, and supported by the faculty of education.

Though there was no department of inclusive education yet existing at the university, it was understood that the experiences gained with observing the development of the Kapsabet School could give incentives to institute such a science within the School of Education. An involvement in such a project could convey insides and experiences of building up vocational training schools, the formulation

and applying of curricula, and the developing of methods for teaching the deaf to the use of instruments and technology they normally are not confronted with. Finally, university students from the departments of technology and education could be given the opportunity for student teaching, whereby the Kapsabet experience would multiply at other places later on. To the Kapsabet School of the Deaf this co-operation provided a platform for discussion, a possibility of evaluating its program, and receiving additional manpower support through student teaching.

The co-operation became educationally and scientifically even more meaningful to both institutions by also admitting deaf and hearing students together to the Vocational School, thus entering into a new experience of inclusive education. Thereby the partners entered new grounds. The purpose of it is that support is given to the deaf by the hearing students in a technical environment, where hearing is normally a necessity in handling instruments and machinery. It will also be of interest to see how this project echoes beyond the period of training into the future, when these youngsters will put their professions into practice, when they will enter and compete on a free market.

The implementation of this project took quite some time and energy of all partners. On the university level the constant move of personnel delayed the formulation of a strategy of co-operation for some time, while to the Kapsabet administration and its board it was always important to spell out anew the level of co-operation between the two independent and entirely different institutions. Most difficult for SAI, however, was to get the donated tools and machinery custom free into Kenya, a process that itself took more than one year. Furthermore the selection of tools and machinery proved to be complicated as one could not build on previous experiences. Even similar schools of the deaf in Germany were not exemplary, since they were not equipped for this type of an educational program.

To begin with, SAI invited the headmaster, Peter Songok, and one of his senior-teacher, Beda Sang, of the Kapsabet School, accompanied by a faculty member of the School of Education of the University of Eastern Africa to Germany in 2005. This visit was sponsored by the Ministry of Economy of the State of Hesse, one of the states in the Federal Republic of Germany. The purpose of this visit was to give the African educators an inside into the set-up and administration of similar schools and homes of the deaf and other handicapped persons. The Johannes-Vatter School of the Deaf in Friedberg, the Rehabilitation Centre for multiple handicapped children in Hohensolms, and the workshops of handicapped of the Scheuern/Nassau Homes were visited.

The project funds were made available by the Federal Ministry of Development and Co-operation and SUPPORT AFRICA e. V. in Germany. The total costs of the project amounted to 130.000 €, the Kapsabet School sharing 15% of the total cost, while the Kenyan government joint in by constructing an additional school building. It took four years from the time of acquiring the funds to the implementation of the project.

The forgoing experience shows how meaningful a co-operation between a school of special education and a university school of education can become, when universities give a helping hand to social and educational institutions. At the end both partners are profiting: the existence of a school is strengthened and its future secured, which is especially important at a time when aid projects are often short lived. By way of scientific assistance not only new insides are gained and information but experiences are spread and multiplied. From this point of view this type of co-operation can be heartily recommended to schools of education at sub-Saharan universities with an interest in developing and fostering inclusive education.

Kapsabet School for the Deaf Philosophy, Vision, Mission, Goals and Objectives

Introduction

All human beings regardless of body deformities or intellectual handicaps have a right to education and a means of ascertaining reasonable livelihood both, for themselves and societies where they belong to. While the normal person may find it easy to interact with the environment and get means to comfortable livelihood, persons experiencing impairment usually encounter myriad problems using their senses or body parts to an extent that they require special education related services to experience comfortable living standards.

Kapsabet Vocational Training School is one of the special schools in Kenya, emphasising the validity of human qualities, attributes, abilities and potential of persons with hearing impairment. It focuses on the attainment of excellent vocational skills and social interaction in an inclusive learning environment in a bid to diffuse the social stigma related to the disability and the occupational status. It seeks to foster the understanding that the deaf can contribute significantly to the socio-economic development of the society in an inclusive environment.

Philosophy

The philosophy of the Kapsabet Vocational Training School is to provide a quality vocational program for the deaf and hearing to develop their physical, mental and spiritual capabilities for the joy of service to God and humanity.

Vision

The vision of the project is to produce vocationally oriented youths who will be able to contribute to their socio-economic well-being as well as to their families, communities and the nation at large.

Mission

The mission of this project is to provide and advance a vocational approach to solving the social-economic problems of the deaf and hearing in an integrated vocational curriculum.

Goal

The goal is to reduce misunderstandings involving abilities of the deaf by alleviating their economic handicap and having the community accept them as partners in the socio-economic development.



Project objectives

Trainees who complete this program successfully should be able to:

1. Be aware of their God given talents and abilities.
2. Be aware of how their talents and potentials can contribute to their economic empowerment.
3. Recognize stereotyping and scapegoating in what is communicated to them about their disabilities.
4. Evaluate their abilities objectively.
5. Accept the uniqueness of each individual whether able or disabled.
6. Accept that every human being has a duty to exploit their God given potentials and abilities.
7. Accept their hearing disability without feeling insecure.
8. Master the basic vocational skills necessary for economic empowerment.
9. Recognize that talents and potentials can be stimulated through a vocational training program.

Visitations 2007/08

The president of SUPPORT AFRICA INTERNATIONAL, Prof. Dr. B. Pfeiffer, and the secretary/treasurer, Dr. Joachim Hölzl, visited universities in Eastern Africa from April 7 -19, 2007, discussing with the university administrations the development of various projects supported by SAI. They visited Maseno University, the University of Eastern Africa, and Moi University in Kenya.

In a second visit to the Eastern African universities in November 2007, Prof. Dr. B. Pfeiffer and the Vice President of SAI, Dorothee Grebe, visited again the Kenyan universities mentioned above in addition to Kenyatta University in Nairobi. In Uganda they contacted Nkumba University and Bugema University.

The headquarters in Germany was also privileged of receiving guests from African universities. In September, the Dean of the School of Agriculture of the University of Calabar, Prof. Dr. Uche C. Amalu, came to Berg, followed in October by the Vice Chancellor of Moi University, Prof. Dr. Richard K. Mibey with his delegation including

Mrs. Cecilia L. Irina, Principal Administrative Officer (Planning), Dr. John T. Githaiga and Dr. David R. Tuigong of the Department of Textile Engineering.



Delegation of Moi University visiting Berlin

In November the Vice President of Babcock University, Prof. Dr. James A. K. Makinde with his Vice President for Development and Strategy, Olukunle A. Iyana, came to Berg for consultations.

Finally, Dr. Romain L. G. Kaikai of the Faculty of Agronomic Science of the University of Abomey-Calavi, Benin, was hosted by SAI February 17, 2008 in connection with an Award Ceremony in his behalf.

Board members of SAI are planning to visit again universities in Kenya and Uganda in 2008. Visits are also scheduled to Ghana and Cameroon.

10 Years SUPPORT AFRICA

SUPPORT AFRICA celebrated its 10th anniversary in the Cultural Centre of the small town of Nassau, Germany, Sept. 29, 2007. The honorary guest speaker was Prof. Dr. Uche C. Amalu, Dean of the School of Agriculture of the University of Calabar, Nigeria, who addressed the members of SUPPORT AFRICA attending from all over Germany. The NGO's support given to universities in sub-Saharan Africa amounted to 1.680.000 € since its foundation.

SUPPORT AFRICA was founded as a non-governmental and non-religious organisation on March 26, 1997. During the first ten years it was able to support projects in Ethiopia, Ghana, Kenya, Nigeria, and Uganda. Universities in Cameroon and the Congo will be added next to its project outreach program. However, with the help of the research activities of its twin-organisation, SUPPORT AFRICA INTERNATIONAL (SAI), most of all the other countries of sub-Saharan Africa were reached, too. SAI is representing both organisations in Africa.

More than half of the activities implemented were in the area of health projects. The NGO prefers to support university clinics in supplying medical equipment and instruments, while the universities themselves provide the buildings. The projects supported aim first of all at stabilising basic medicine at university campuses and the surrounding communities, but having in mind that on the academic side health sciences will be offered in the future if they don't exist already. As the rule, public health and nursing are the first to come into existence, medical sciences are following somewhat later on due to their heavy financial and man-power investments. Fortunately, young sub-Saharan African universities pick up this challenge by and by.

SUPPORT AFRICA also renders assistance to social programs. In co-operation with the Department of Education of the University of Eastern Africa (Kenya), for instance, a vocational school for the deaf was sponsored. The university department monitors the educational development of that school, where hearing and non-hearing students are educated together in an inclusive program. Special interest is given to the curricula development, the results of jointly teaching hearing and non-hearing pupils, the

use of technology by the non-hearing and their professional acceptance in the community after graduation. The newly founded school also serves as a centre for student teaching of various university departments.

Another social/educational projects supported will be the women centre run by the Department of Social Science at Nkumba University, Uganda. Here, several services for women will be brought together from gynaecological and health needs, women education and trades, kindergarten and a revolving fund. Also university students get first-hand insights into various social aspects, thus the project follows likewise the principle of strengthening the educational program of university departments in serving the community at the same time. Next to these programs SAI also has been active in supporting other sciences, especially projects in agriculture.

Naturally, it is not easy to implement projects at sub-Saharan universities. Among the problem faced the release of containers from African ports due to the lengthy and often confusing procedures of costume exemptions ranks very highly. Next comes the delay of the completion of buildings for all kinds of reason and the recruiting of personnel. But on the rule, much more time has to be provided for the finishing of projects than one would usually anticipate. This causes great problems for a science-bound society, where the time element must be calculable. Yet understanding the causes of such hindering factors, all projects of SAI were completed and are still functioning. For planning and implementing projects, SAI principally supplies no man-power but rather understands that the universities are able of successfully handling all facets of the projects.

Activities and responsibilities of the twin organisations

SUPPORT AFRICA	
Founded:	1997
Type:	development cooperation org.
Membership:	individuals/companies
Purpose:	development projects
Support:	African universities
Publication:	Info (German)

SUPPORT AFRICA INTERNATIONAL	
Founded:	1999
Type:	research organization
Membership:	African universities
Purpose:	research awards, research, university development
Support:	African universities
Publication:	Research and Development, Studies in Sub-Saharan Africa

Honorable members and friends of SUPPORT AFRICA

In view of the special occasion of celebration of your 10th anniversary, I am forwarding the best wishes of success for your further activities in the development of sub-Saharan Africa. I thank you very much for your efforts and engagement in solving problems in the countries south of the Sahara. SUPPORT AFRICA e. V. assists scientists and students at African universities to actively participate in the development of their countries with their potentials and know-how. Reaching the millennium goals is only possible with the engagement of all groups of society. African professors, experts and graduates especially have to play a very important role in this endeavour. SUPPORT AFRICA has supported the development of health centres at universities in countries south of the Sahara and as such made it possible to come closer in reaching the millennium goal of improving basic medicine and health sciences of the people. At the same time an important prerequisite was prepared for the future training of medical staff in the region.

I am very happy about the engagement of the members of SUPPORT AFRICA e. V., who not only were helping in improving basic medicine and health care but also supported the development of the rural economy and special education. With your efforts for the handicapped people, you made a very important contribution to the improvement of the living condition of disadvantaged persons in many countries in sub-Saharan Africa.

Sincerely yours,

Heidemarie Wiczorek-Zeul

Federal Minister for Economic Co-operation and Development

Award Programs of SUPPORT AFRICA INTERNATIONAL

SUPPORT AFRICA INTERNATIONAL offers awards in the fields of agriculture, ecology and inclusive education. The price money is 2.500,00 € for the main winners. Sometimes a merit award is also granted, if the runner-up is very close to the winner. The calls for scientific papers are annually send out in January to be handed in by August 31 of the same year. Due to the many applications received, the winners cannot be announced before Spring in the following year.

The purpose for granting the awards is to give African scholars a chance for raising their

academic voice. Though the price money is a challenge, the chance of publishing a paper in an international series is an advantage at the same time. So far the results in the field of agriculture were published in two volumes, the third is to appear in 2008. The papers in ecology and education will follow in due time also in the series "Studies in sub-Saharan Africa".

A first attempt of a call in the health sciences in 2005 was not continued. But SAI is working hard to come back with this topic. The calls for papers in Special Education in 2005 and

2006 were not too successful, due to the fact, that this science most likely is not yet strongly established at African universities. Therefore, there is a shift in 2008 to a wider topic, the science of inclusive education, which will give to many scientists a chance to participate in the fields of educational and related sciences. Research proposals are not called for!

For further information on the SAI awards, pay attention to the announcements in our journal "Research and Development", at our posters at university bulletin boards, or in our home page www.support-africa.de.

Research Award 2005 for Sustainable Agriculture

Dr. A. S. Oyekale
Department of Agricultural Economics
University of Ibadan, Nigeria



Research topic: "Farmers' involvement in behaviors prone to HIV/AIDS infection and food production efficiency in rural Nigeria"

Research Award 2006 for Sustainable Agriculture

Dr. George Ouma
Department of Botany and Horticulture
Maseno University, Kenya



Research topic: "Application on organic farming for sustainable horticultural production to reduce poverty, improve food security and health of rural households, and environmental conservation in Kenya."

Research Award 2007 for Ecology

Dr. Glélé Romain Kakai Agbidinokoun
Faculty of Agronomic Sciences
University of d'Abomey-Calavi (UAC), Benin



Research topic: "Structure and spatial distribution patterns of two Isoberlina dominated communities in the Wari-Marô forest reserve (Benin)"

Research Award 2007 for Sustainable Agriculture

1st winner: F. L. Mkandawire
Department of Agriculture
University of Eastern Africa, Kenya

Research topic: "Low-input agricultural technologies for sub-Saharan Africa: Applied methods"

Merit Winner: Mkpado Mmaduabuchukwu
Department of Agricultural Economics
Novena University, Nigeria

Research topic: "Refined indigenous knowledge as source of low input agriculture technologies in sub-Saharan Africa rural communities"

Research Award 2007 for Inclusive Education

Scientists: **Prof. Dr. Uche C. Amalu*** and **Dr. M. N. Amalu****
*Department of Soil Science, **International Secondary School
University of Calabar, Nigeria

Research topic: "The situation and solutions of institutional and community based rehabilitation for persons with mental and physical disabilities in sub-Saharan Africa."



Flies and human health in sub-Saharan Africa

The periodic abundance of fly population and the prevalence of enteric infections in children in Malawi

Ceasar H. Mkandawire, Msc, College of Nursing, University of Malawi, Kamuzu

Summary

Many children under the age of five die of enteric diseases in sub-Saharan Africa. Enteric infections are manifested by diarrhoea, which is estimated to be responsible for 25 to 75% of all childhood illnesses in Africa. Many intervention strategies have been put in place to reduce enteric infections. This study was designed to find out if there is any correlation between seasonal abundance of flies and prevalence of enteric infections in children. A positive correlation, with more studies on the two variables, may justify inclusion of flies as a public health priority, when designing intervention strategies for enteric infections.

Specific study sites were selected from which flies were sampled. Records of enteric infections in children under the age of five years were collected from health institutions within the study sites. Flies were sampled by trapping them by using baited traps. Records of enteric infections were collected every month from the health centres for one year. Sampling of flies was done every month for the same length of time for one year.

There was a significant positive correlation between abundance of flies and prevalence of enteric infections in both sites (0.749 for site 1 and 0.766 for site 2; $p > 0.01$). Flies were more abundant between November and February, and this corresponded with an increase in number of hospital cases of enteric infections. Higher mortality rates from diarrhoea have been observed in some countries during the rainy season (Greenwood, Greenwood, Bradley, Tulloch, Hayes and Oldfield, 1987).

Flies have a significant role in the transmission of parasites, which cause enteric infections, mostly manifested by diarrhoeas of different forms. In designing public health interventions to control enteric infections, control of flies should be considered as a priority.

Introduction

There is widespread prevalence of enteric pathogens, which colonise the human gastrointestinal tract in tropical developing countries. This could be reflected of environmental contamination, inadequate water supply, and poor sanitation (Mathan, 1998). It could also be due to an observation

that most Africans are indifferent to low standards of hygiene. Enteric infections, which are manifested by different types of diarrhoea, are one of the top three causes of childhood morbidity and mortality in sub-Saharan Africa, estimated from community-based surveys or vital statistics registries and census data (Hammer, Simon, Thea, and Keusch, 1998). Approximately 40% of childhood death from enteric infections world-wide occur in sub-Saharan Africa, although only 19% of the world's population under the age of five years lives in this region (Ekanem, Adedeji and Akitoeye, 1994). Diarrhoea has been estimated to be responsible for 25% to 75% of all childhood illnesses in Africa (Kirkwood, 1991). During the post-neonatal period infants are at the greatest risk of lethal diarrhoeal disease (Snyder and Merson, 1982). A comprehensive analysis of studies from some countries found that children under five years of age in sub-Saharan Africa experience about five episodes of diarrhoea each year (Kirkwood, 1991). The high morbidity and mortality associated with enteric infections has led to the management of these infections being a major priority in primary health care, which emphasises on improvement of economic status, safe water supply, and environmental sanitation, which would ultimately reduce the prevalence of enteric infections as major public health problem in Africa (Hammer et al, 1998).

Enteric infections are caused mostly through ingestion of food or water contaminated with human faecal material. Spread is usually from human source and generally involves one of the following ways: food, flies, fingers, or faeces.

The most vulnerable age group to flies is children, particularly those under five who have been observed to have flies on their bodies, or flies entering the face orifices and the mouth (personal observation). This is possible because they are not able to feel the presence of the flies on their bodies or because they are not able to discriminate flies from other objects on their skin surface. The other feature that makes children attractive objects to flies is the hygienic state in which they (children) are found. Most children in sub-Saharan Africa are often bodily dirty with fluids, such as phlegm and saliva, running on their faces while putting on soiled diapers.

Factors contributing to the unhygienic state of the children range from poverty to lack of education. This has led to high child mortality due to enteric infections (Hammer, et al, 1998; Sullivan, 2001).

There are many species of flies that are found in tropical Africa. The commonest families are Muscidae, Caliphoridae, Sarcophagidae, and Cuterebridae. The medically most important flies belong to the family Muscidae, genus *Musca*, such as the common housefly (*Musca domestica*). Improper disposal of human excreta and waste contributes greatly to the abundance of flies. Flies tend to increase in population in the wetter months of the year, when sanitary conditions are at their lowest. Flies are also attracted to food sources that are exposed such as when people eat outdoors. They have also been observed to dare hot food such as roasting beef on open braai (personal observation).

Material and method

a. Study sites

These were selected on the basis of presence of a health centre with about five kilometre radius as its catchment area. Flies were sampled from the catchment areas and hospital records of enteric infections were gathered from records kept by the health centres. Two sites with different characteristics were studied (Table 1). The use of contrasting sites was to remove the effects of hygiene, sanitation, and safe water, so as to get an independent observation not influenced by other factors. Both study sites are within the city boundaries of Lilongwe, the capital of Malawi.

Characteristics	Study sites	1	2
Density		High	Low
Sanitation		poor	good
Waste disposal		poor/none	fair/poor
Effluence disposal		poor/none	good
Income status		low	high

Table 1. Description of the study sites

b. Sampling of flies

Flies were collected from study sites using baited traps impregnated with a combination of insecticides, which kill the flies upon alighting on them. The dead flies were

collected in special receptacles just below the trap. The traps were placed randomly around each study site for about four hours per day. Five trappings were made each month of the year for each study site. The mean monthly records are as shown in Table 3 under results. The flies were then sorted according to taxa and recognised (Table 2).

c. Enteric Infections

The numbers of enteric infections were gathered from records provided by the health centres around each study site. A total of twelve visits were made to each health centre. Records were collected at the beginning of each month for the previous month's cases of enteric infections. The results are presented in Table 3 in parenthesis, as total number of all enteric infections without regard to type of infection.

d. Data analysis

The study aimed at establishing the possibility of existence of a relationship between prevalence of enteric infections in children and the seasonal abundance of flies. The acceptability of the claim would show the possibility of flies being included in diarrhoeal interventions. The SDPSS computer package was used to calculate the Pearson product moment correlation coefficient, *r*.

Results were also presented graphically to show the relationship between the two variables for each site.

Results

Abundance and diversity of flies

The group of flies that were sampled comprised the Genus *Musca*, of which the commonest species was *M. domestica*. Very few flies belonged to species *M. sorbens* (Table 2). Flies of the species *Stomoxys calcitrans*, commonly known as stable flies, were also represented but not as abundantly. Other families found were metallic calliphorids (Fam Calliphoridae), commonly known as blow-flies, such as the bluebottles (*Calliphora*), and the green bottles (*Lucilia*). Non-metallic calliphorid flies were represented by only one species *Cordylobia anthropophaga*, also commonly called the mango fly. Results showed that the abundant fly species was *M. domestica* representing 87% of the total catch, while the calliphorids *Cordylobia* sp, *Lucilia* sp and *Calliphora* sp accounted for 9%; *Stomoxys calcitrans* for 3%, and *M. sorbens* accounted for 1%. The total number of all flies caught in each taxon is even in Table 2. Note that different groups of flies were caught but not anyone group was studied as the major vector of enteric

infections. The total number of all flies caught in a site could be a reflection of the characteristics of the site. Site 1, which has a high population density, had a higher catch of flies (12,163) than site 2 (Figure 1a). Sanitary conditions in site 1 are very poor and dumping of waste is not organised. This, coupled with high population density, could have contributed to a higher abundance of flies, as it is believed that most flies are synanthropic (domestic). Site 2 had a lower fly population sample (5,907) (Table 3) (Figure 1a). Site 2 is a highly developed location of high-income earners with proper sanitary conditions and good effluence disposal network. The occurrence of flies in the site might be proof that sanitation, hygiene, clean water alone cannot reduce enteric infections.

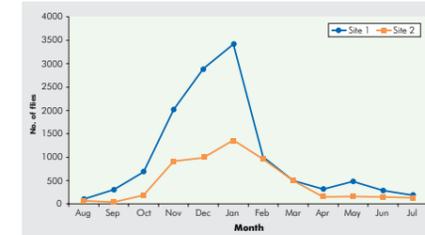


Figure 1 a: Comparison of mean number of flies for the two sites

Number of flies in each taxon from each site

	Site 1	Site 2	Totals
Muscidae			
<i>Musca domestica</i>	10459	4647	15106
<i>M. sorbens</i>	123	51	174
<i>Stomoxys Calcitrans</i>	345	102	447
Calliphoridae	1236	407	1643
Totals	12163	5207	17370

Table 2 Taxa of flies sampled from the different sites

Study sites

Month	Site 1	Site 2
August	99 (351)	66 (24)
September	302 (336)	41 (13)
October	680 (280)	188 (69)
November	2017 (392)	911 (118)
December	2888 (695)	989 (221)
January	3413 (515)	1360 (115)
February	1001 (569)	961 (98)
March	502 (312)	501 (121)
April	312 (289)	150 (82)
May	481 (141)	162 (29)
June	284 (214)	147 (27)
July	184 (167)	131 (12)
Totals Enteric infections	12163 (4624)	5907 (929)

Table 3 Monthly means of all flies and total monthly reported cases of enteric infections (in parenthesis) from each site.

Enteric infections

The total monthly numbers of enteric infections for each site was determined and presented in Table 3 in parenthesis. There were more infections in site 1 than in site 2, just as there were a higher mean number of flies in site 1 than in site 2 (Table 3) (Figure 1 a

and 1 b). The two trends for each site correlated positively with the number of flies ($r = 0.749$ for site 1 and $r = 0.766$ for site 2) (Figures 2a and 2b). The reported enteric infections from both health centres were acute infective diarrhoea (79%), which is characterised by water stool, cholera (29%), characterised by bloody and rice water stool, and dysentery 1%, identified by profuse bloody stool. Site 1 reported all the three types of infections whereas site 2 did not report any cholera cases. In both sites the most reported enteric cases were acute infective diarrhoea, described as the major clinical problem in tropical countries, and persistent diarrhoea. Acute infective diarrhoea is commonly associated with faecal waste contamination, whereas persistent diarrhoea is associated with malnutrition. Despite high standards of sanitation in site 2, cases of enteric infections might have come about because of the high foraging capability of flies, which can invade

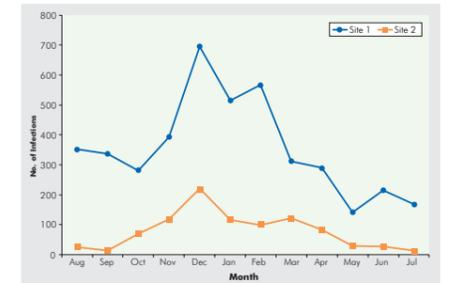


Figure 1 b A comparison of enteric infections between the two sites

Correlation between flies and enteric infections

Results show that there was a positive correlation between the two variables for both sites, 0.749 ($p < 0.01$) for site 1 and 0.766 ($p > 0.01$) for site 2. The graphs of Figures 2a and 2b also show common patterns of the abundance of flies and prevalence of enteric infections over the year. That is, cases of enteric infections in health centres were more common and numerous in months recording high fly abundance. The relationship can be part of a hypothetical vicious circle with regard to enteric infections. Rain results in a lot of



water, which wets rubbish on which flies breed and increase their populations coupled with poor sanitary conditions resulting in more transmissions of enteric parasites and thus more infections. During the cold dry months (May to part of August) fly populations go down, because their rate of breeding falls due to low temperatures and lack of enough breeding sites (Service, 1986). Consequently

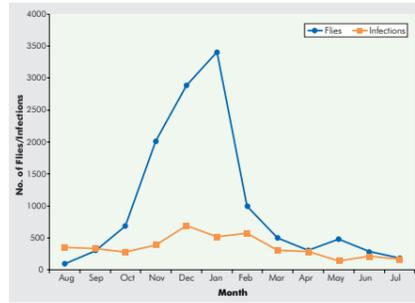


Figure 2 a Correlation between number of flies and enteric infections in site 1

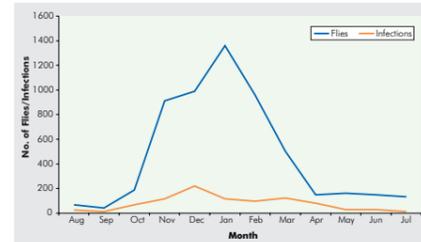


Figure 2 b Relationship between number of flies and cases of enteric infections in site 2

Discussion

Enteric infections are recognised as the most frequent cause of childhood death in tropical countries (Bern, Martines, de Zoysa, and Glass, 1992; WHO/UNICEF/WSSCC, 2000). Current estimates world-wide show that at least 3.5 million children under the age of 5 die each year due to enteric infections that produce diarrhoea (UNICEF, 1998). Many factors contribute to the causes of the enteric infections, which include poor sanitation, dirty drinking water, and eating contaminated food. In Malawi the causal pathogens of enteric infections, which are manifested by diarrhoea, have been identified as viruses (DHO, 2003). However, bacterial diarrhoeas also prevail, though they have not been characterised. This is because diarrhoea is just a symptom of the reaction of the gastrointestinal tract to a variety of enteric pathogens (viral, bacterial, fungal or parasites). Etiological characterisation of diarrhoeal type is thus considered cumbersome (Mathan, 1998). Health centres and hospitals resort to clinical characterisation of diarrhoeal infections based on duration of diarrhoea and character of stool. Acute infective diarrhoea is self-limited and lasts for less than 14 days. Diarrhoea, which lasts longer than 14 days, is classified as persistent diarrhoea, and if the duration of symptoms is longer than a month, it is called chronic diarrhoea (Mathan, 1998).

Many approaches to intervention of enteric infections have been used in many parts of Africa. In Malawi a case-control approach was used to study the effectiveness of clean drinking water and improved sanitation facilities on diarrhoeal morbidity. The incidence of going to a health centre due to acute diarrhoea was reduced by 20% in children with access to improved sanitation and water supplies. However, the effect was not statistically significant (Hamar et al, 1998). Similar estimates of the reduction in diarrhoeal morbidity (22%) were obtained from a review of world-wide studies of the impact of sanitation. However, the assessment of the effect of sanitation, water, and public health education interventions on morbidity and mortality due to diarrhoeal infection still remains a challenge that requires more studies. The results of this study have shown that flies occur even in places where the standards of hygiene are very high. The implication of this finding is that flies must be included in intervention studies of diarrhoeal diseases.

Interventions may also be confounded by observations like the fact that some members of the population carry the infectious pathogens in their gastrointestinal tract without showing symptoms, and the pathogens are easily voided in faeces and transmitted to healthy children using different routes. Microbial enteric pathogens have been demonstrated in samples of faeces from healthy asymptomatic populations in the tropics (Rajan and Mathan, 1986). Enteric

pathogens are borne by asymptomatic individuals, who then void the pathogens in faeces, which are then transmitted to other healthy individuals. The widespread prevalence of enteric pathogens, which colonise the human gastrointestinal tract in asymptomatic individuals, is a reflection of the adaptation of the intestinal mucosal to presence of parasites, with respect to morphology and function (Mathan, 1998). The mucosa of the small intestines of people who live in tropical areas is characterised by reduction of the height of villi and increased thickness of the crypt layer. Asymptomatic individuals thus carry the pathogens without ill effects to them. This perpetuates the existence of the pathogens in human population. So, communities might have clean drinking water, proper sanitary facilities, and the like, but still report cases of enteric infections. This is because other avenues of transmission were not fully considered when implementing interventions. Thus, integrated approaches are recommended though they may be difficult to access.

Flies are considered the most efficient vehicles of transmission of enteric infections because of their indiscriminate behaviour of landing anywhere. They have a high rate of reproduction, so that they cannot make up in mass they make up in numbers. For example, a female housefly (*M. domestica*) can lay up to 600 eggs in its lifetime. Developmental time from egg to adult depends on temperature and presence of food. Developmental time between 30°C and 35°C

is about 7 to 8 days, which means every week there are new cohorts of flies added into population (Service, 1986). Developmental time below 16°C is about 49 days, and most larva die below 15°C. Adult flies can fly 3-4 km from their site of emergence, and may travel as far as 35 km, demonstrating the extent to which they can transmit infections (Busvine, 1980). Houseflies and calliphorid flies are also referred to as domestic or synanthropic flies, because they live close association with human homes.

Because of their indiscriminate habits houseflies are potential carriers of many human pathogens, but it is difficult to directly assess their relative importance in the transmission of infections. Information of their involvement in the spread of infections is circumstantial, as this study found that fly abundance is correlated closely with incidences of enteric infections. However, more comprehensive and detailed studies need to be done in order to positively implicate flies as culprits. In a demonstration done in Texas in 1946 and 1947, one town was sprayed with DDT to destroy houseflies. This resulted in reduced incidences of *Shigella* infections and a marked decrease in the number of death in children due to diarrhoea. In the unsprayed part of town, there was no reduction of *Shigella* infections. Similar associations between the incidence of diarrhoea and housefly abundance have been observed in Palestinian refugee campus (Service, 1986).

Many intervention strategies for enteric infections in children have been tried and continue being used. However, flies have so far received very little or no attention. This study proposes that intervention should include flies; these would include poisoning them, destroying their breeding places, and other more sophisticated techniques such as the sterile-male release technique. The immediate objective would be to reduce the population of flies in human communities in sub-Saharan Africa. This action may significantly reduce cases of enteric infections.

Reference

- Bern, C., Martines, J, de Zoysa, I. and R. I. Gass (1992). The magnitude of the global problem of diarrhoeal disease: a ten-year update. *Bull World Health Organ*, 70.
- Kirkwood, B. R. Diarrhoea. In: *Disease and mortality in sub-Saharan Africa*. (Feachem, R. D. and D. T. Jamison, eds.) University Press New York, Oxford.
- Busvine, J. R. (1980). Insect and hygiene. The biology and control of insect pests of medical and domestic importance. Chapman and Hall, London.
- Mathan, V. I. (1998). Diarrhoeal diseases. *British Medical Bulletin*, 54, 2.
- Rajan, D. P. and V. I. Mathan (1985). The prevalence of bacterial enteric pathogens in a healthy population in Southern India. *Med Microbiology*, 70, 22.
- District Health Office, DHO, 2002. Lilongwe
- District Health Office, DHO, 2003.
- Service, M. W. (1986) Lecture notes on medical entomology. Blackwell Scientific Publications, Oxford.
- Greenwood, B. M., Greenwood, A. M., Bradley, A. K. (1987), Tulloch, S, Hates, R. and F. S. J. Oldfield. Deaths in infancy and early childhood in a well vaccinated rural West African population. *The state of the world's children*. UNICEF, 1998.
- Paediatr, Ann Trop, J. Hamer, D.H., Simon, J., Thea, D. and G. T. Keusch (1998). Childhood diarrhoea in sub-Saharan Africa, *Child Health Care Report*.
- Snyder, J. D. and M. H. Merson (1982). The magnitude of the global problem of acute diarrhoeal disease: a review of active surveillance data. *WHO Bulletin*, 60.
- Global water supply and sanitation assessment. WHO and UNICEF, 2000.

Research and Development in sub-Saharan Africa

Publisher

A publication of SUPPORT AFRICA INTERNATIONAL, Association for the Support of Higher Schools for Applied Sciences, Colleges and Universities, Inc.

Alte Str. 19
D-56357 Berg/Taunus, Germany
Tel. 0049-6772-1480
Fax 0049-6772-8680
e-mail: info@support-africa.de
web: www.support-africa.de

Research and Development in Africa is published annually. Circulation is 1000. It is freely available to members of SAI and to African Schools of Higher Learning.

Honorary Members

Dorothee Grebe, GREBE GROUP, Germany

Prof. W. Senteza Kajubi, former Vice-Chancellor, Nukumba University, Uganda

Prof. Dr. D. K. Some, former Vice-Chancellor, Moi University, Kenya

Prof. Dr. Mutuku J. Mutinga, former Vice-Chancellor, University of Eastern Afrika, Kenya

Editorial Committee

Dr. phil. Dr. h.c. Baldur Ed. Pfeiffer
Professor of History
University of Eastern Africa, Kenya

Uche C. Amalu, Ph.D., Professor of Soil Science, University of Calabar, Nigeria

Dr. rer. nat. Paul K. Ndalut, Professor of Chemistry, Moi University, Kenya

Editorial Staff

G. Pfeiffer

Design, Layout

graphic-studio K. Kraft-Wehler, Westermohe, Germany

WEILBURGER Coatings GmbH

Industrial Coatings

high commitment to innovation +++ trustful partnership +++ global presence
flexibility +++ vitality +++ intelligent solutions
diversity +++ functionality +++ improvement +++ value enhancement

sponsored by:

WEILBURGER Coatings GmbH
Ahauser Weg 12-22 | D-35783 Weilburg/Lahn (Germany) | Tel.: +49 64 71 315-0 |
Fax: +49 64 71 315-316 | info@weilburger-coatings.de | www.weilburger-coatings.de

