

**Report on current situation in the health sector of Ghana
and possible roles for appropriate transport technology and transport related
communication interventions**

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(Time- and Workplan see attachment)

Prepared by

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Abbreviations

CHAG	Christian Health Association Ghana
CHO	Community Health Officer
CHPS	Community Based Health Planning and Services
CHV	Community Health Volunteer
GHS	Ghana Health Service
IBD	Independent Bike Dealer
ITDP	Institute for Transport and Development Policy
MDG	Millennium Development Goals
MOH	Ministry of Health
NGO	Non Governmental Organisation
PPE	Planning, Performance and Evaluation
SD	Sub-district
SSA	Sub Saharan Africa
WHO	World Health Organisation
ZBMMS	Zero Breakdown Maintenance Modular System

1. Persons and Institutions interviewed:

Main NGOs and international organisations active in the country are CHAG (Christian Health Association Ghana), Save the Children UK, Health Professionals for Health, of which the following persons were interviewed:

1.1 High level

- Dr. Wolfram Hammer / GTZ Health Division / Eschborn, Germany
- Dr. Andreas Grueb / GTZ Country Office / Accra, Ghana
- Janet Quansah, Ghana Health Service / Accra, Ghana
- Ebo Hammond / Dir. Ghana Health Service / Accra, Ghana
- Sillibert Kankye / Exec. Dir. Christian Health Association CHAG / Accra, Ghana
- Frank Nyonator / Dir. GHS PPE / Accra, Ghana
- Dr. S. Addai / Dir. Ministry of Health / Accra, Ghana
- Innocent Gobah / Youth Against Aids / Accra Ghana

1.2 Northern Region: District-, Sub District and Community Level

- TAMALE
- Dr. E. Sory / GHS Regional Director, Regional Health Directorate Northern Region
- Dr. Ofei / GHS Regional Director Central Region / Cape Coast
- Mr. Cedu / Independent Bicycle Dealer IBD / Tamale
- Dr. A. Akwasi Twumasi / Public Health Physician / Regional Health Directorate Northern Region
- Mr. Bawah, Transport Officer / Regional Health Directorate Northern Region

- SABOBA District
- Dr. Apoozan / District Director Saboba District
- Mr. Gregory / Community Health Nurse / Wapuli Health Centre, Saboba District
- Isaac Udin / Subdistrict Nurse / Wapuli, Saboba District
- Moses Akunja / Director Chereponi Sub District
- Gerald Narusi / Director Wenchiki Sub District
- Tabita Kajil / Community Health Officer / CHPS Gbangbanpon, Saboba District
- Cedu Maro / District Health Officer

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- SAVELUGU District
- Dr. Issah / District Director Savelugu District / Northern Region
- Mr. Abuduli / Disease Control Unit Savelugu District
- Patricia Awo / Public Health Nurse / Savelugu District
- Group Discussion Diare Sub District:
 - Rita Opoku (CHN)
 - Memuna Adam (CHN)
 - Fidelia Baeta (CHO)
 - Patience Ladele (Health Aid)
 - Emilia Kakrata (Disease Control)
 - Sarafu Wemah (Midwife)
 - Mariama Abudulai (Midwife Supervisor)

2. Main medical health problems

Like in most countries of sub-saharan Africa, child mortality, maternal death and HIV/Aids are the main medical health problems in Ghana, whereas HIV/Aids is more a prior problem than in Senegal, the second country of this pilot project. Health problems are commonly bigger in rural areas, where nearly 60% of the countries population is living. The data, presented is from both statistical analysis and actual information given in the high level interviews. In view of the Millennium Development Goals, the overall health situation in Ghana reflects the global focus of the health related MDGs:

MDG No.4: Reduce child mortality

Every year nearly 11 million young children die before their fifth birthday – mainly from preventable illnesses

MDG No. 5: Improve maternal health

The risk for women of dying in childbirth in developing countries is one in 48

MDG No. 6: Combat HIV/Aids, malaria and other diseases

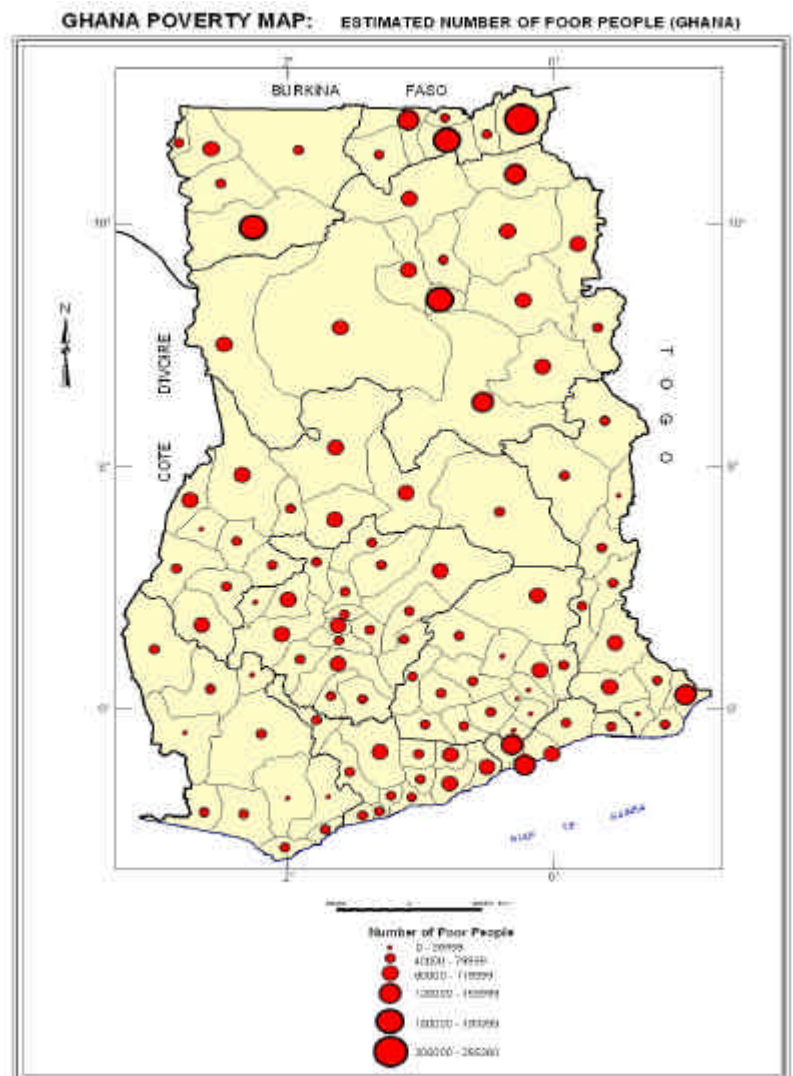
SSA is worst among all countries

According to the poverty map (on the right), there is a huge gap between the northern and the southern part of Ghana, including quality and extent of health services as one indicator for poverty. The regions with the lowest level of health care provision and hence the greatest problems in public health are Upper West, Upper East, Northern and Central, of which the Central Region is exceptionally in the southern part of the country.

Health is commonly seen as one indicator for the poverty map of the country is consisting of the following indicators, of which the last four are health related¹:

- ✍ Household Budget
- ✍ Economic Infrastructure
- ✍ Education
- ✍ Health
- ✍ Social Infrastructure

¹ Source: Ghana Health Report 2003, Ministry of Health, Accra 2004



Some facts for Ghana²:

HIV/Aids is a countrywide major issue – the largest single health problem, accounting for over 40% of outpatient visits, accounting for more than 12% of all deaths in Ghana and resulting in more than 140 000 children orphaned.

Malaria is still one of the main causes of death (no 8 of the top ten)

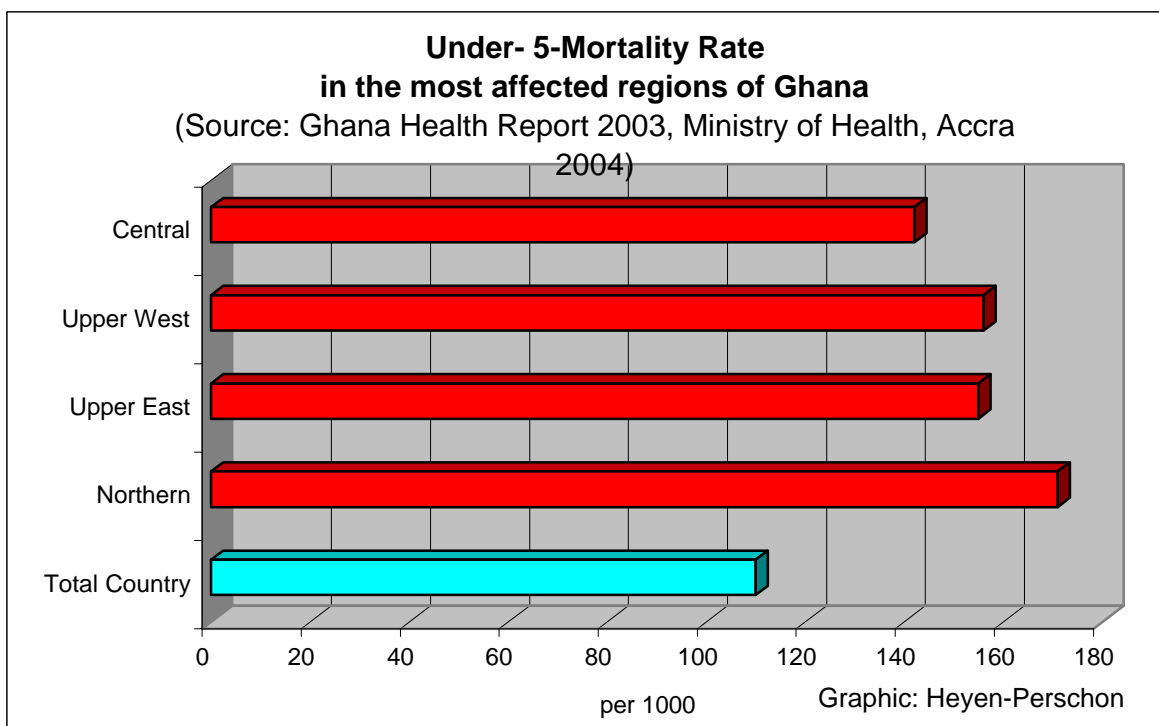
Infant mortality rate and under 5 mortality rate is increasing (64/1000, 111/1000)

Children's underweight ratio is still high (21% in urban, 33% in rural Ghana) – boys are more likely to be underweight than girls.

Maternal mortality rate stagnates at the high level of 220/100.000

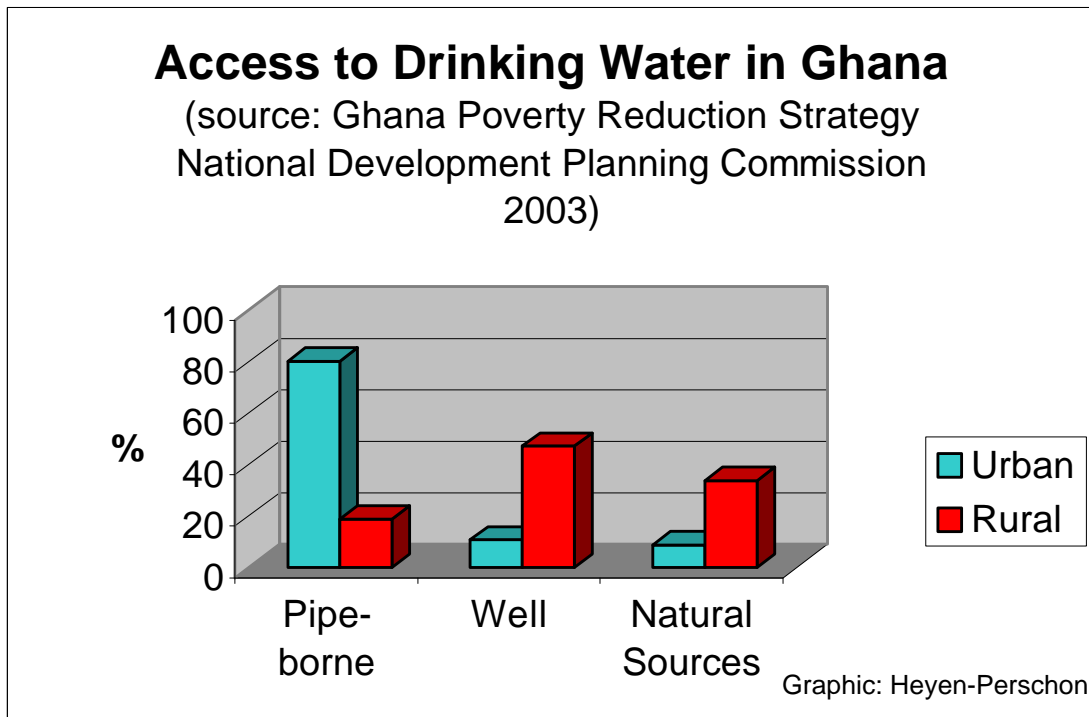
Due to the deep geographical disparities, figures for most of the health indicators are higher in the three northern regions than in the south. Over 30% of the children in the north are not fully immunized before their first birthday. The 31% incidence of diarrhoea in the north is very high compared to the national average of 18%. In this region, one also find the lowest level of prenatal care a the premier and easiest option to lower maternal fatalities - and the need to be transferred when being in labour.

Concerning underweight and nutrition, figures for children under the age of 5 being malnourished are still high in the northern regions – with 34 to 40 children in 100:



² Source: Ghana Health Report 2003, Ministry of Health, Accra 2004

A further significant health determining factor in the north is lack of access to water, nutrition and sanitation (in the rural regions less than 20% of the population have access to pipe-borne drinking water.³



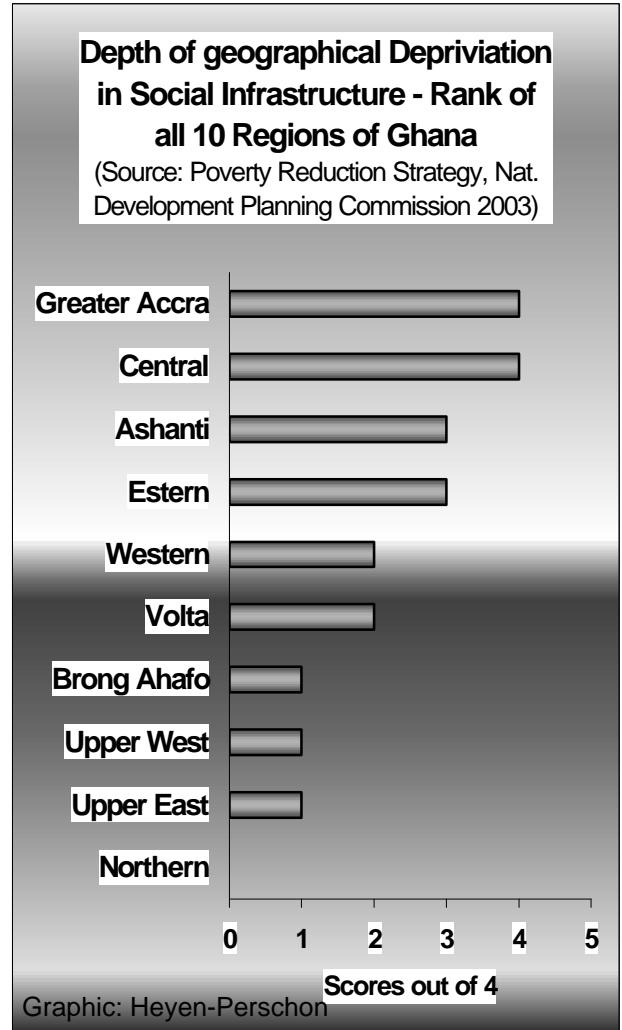
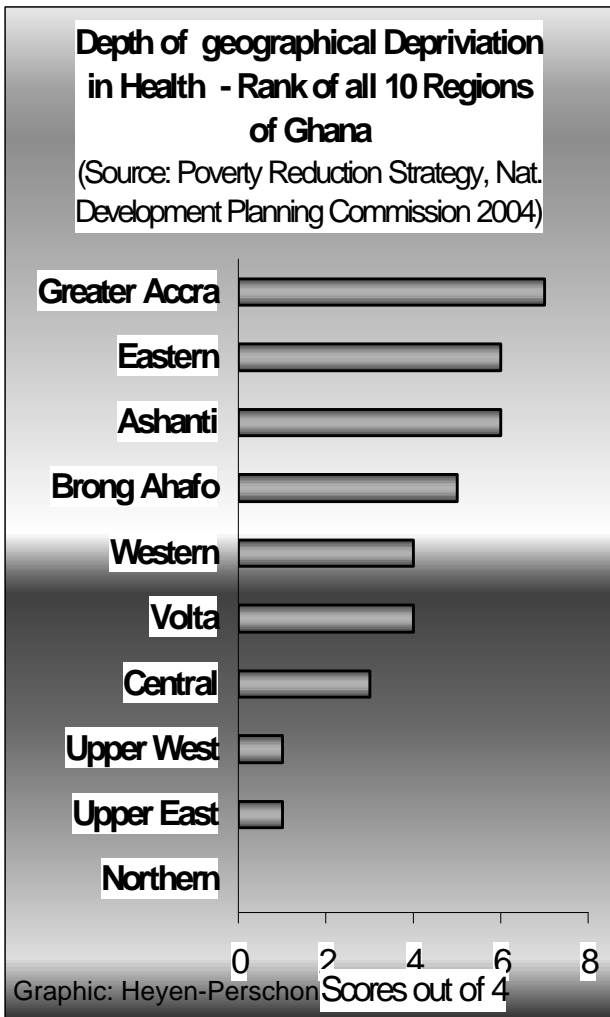
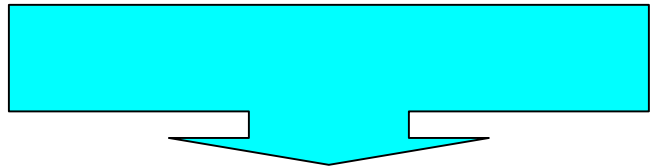
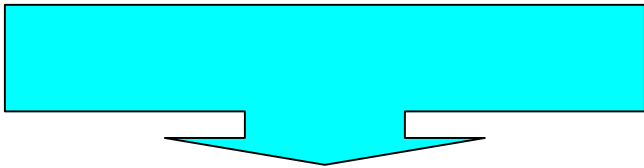
It has to be mentioned, that in most peri-urban areas, the access to safe water is still worsening, causing more and more health problems in affected communities. The reason is that increasing demand on waste management cannot cope with urbanisation, leading to increased pollution of the local water sources.

³ Source : Dyna Arhin-Tinkorang: Revisit of Ghana's Poverty Profile as Inputs into the GMH Initiative, Accra 2002

The analysis of the regional inequalities in health and social infrastructure are basing on 7, respectively 4 quantified parameters and is summarised in two indices and is impressively demonstrating the situation in the Northern Region:

HEALTH PARAMETERS
Under 5 Mortality Rate
Infant Mortality Rate
Maternal Mortality Rate
Family Planning
Supervised Delivery
Immunisation
Under 5 Stunted (relation age/weight)

SOCIAL INFRASTRUCTURE PARAMETERS
Travel Time to Health Facility
Inadequate Health Care
Access to Potable Water
Access to Sanitation



3. The National Health System

3.1 Policy Framework

The policy framework of the national health care system is focusing the core problems of the country. The government is determined to improve access and equity to essential health care and ensure that the health sector plays an essential role in the national Poverty Reduction Strategy. The strategic objectives are⁴:

- a) **Improving geographical access** to primary services and emergency services by placing Health Points with a Community Health Officer in remote rural areas. So-called *CHPS Zones* shall be established country-wide (Community based Health Planning and Services)⁵
- b) **Improving financial access** for the financially vulnerable
- c) **Improving socio-cultural access** for priority groups (children, women, elderly, people with chronic diseases and the disabled)

The CHPS System is now highly supported through the national and regional health administrations because most communities deeply lack access to health facilities. Hence, CHPS is relatively new and most sub districts have developed plans to launch numerous CHPS Zones within the coming years.

Government also defined a core set of “*Top 10-Diseases*” to work with health providers on all levels and specifically concentrate on the poorer areas through the CHPS approach:

1. *HIV/Aids*
2. *Malaria*
3. *Tuberculosis*
4. *Guinea Worm*
5. *Polyomyelitis*
6. *Maternal and Child Health*
7. *Accidents and emergencies*
8. *Non-communicable diseases*
9. *Oral health and eye care*
10. *Specialists services, including psychiatric care*

Government also tries to regulate the activities of the **traditional and alternative medicine** practitioners to eliminate quackery and harmful practices and at the same time develop a national agenda and guidelines for safe alternative and herbal medicine. However, this seems to be in an early stage.⁶

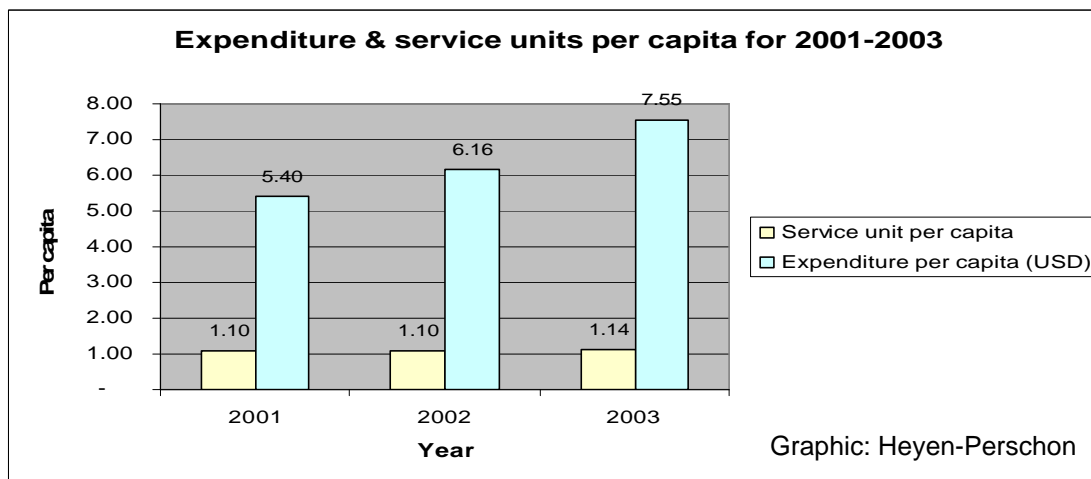
⁴ Ministry of Health: 5-Year Programme of Work 2002-2006. Accra 2003

⁵ Background for this “Close to Client”-System is that the primary producers of health - the individual households - often taking the first key decision to seek health care for her sick child. A CHPS Pilot Project in Nkwanta, Birim North, Asebu-Abura-Kwamankese placed a health worker in the village, which improved health of local people substantially.

⁶ Ministry of Health: 5-Year Programme of Work 2002-2006. Accra 2003

3.2 Financial Situation

Spending on public sector health services has increased by nearly 30% since 2001, yet this increase in expenditure hasn't been reflected in indicators of output, which grew far more modestly:



3.3 Transport Policy

The country has developed a comprehensive transport policy for regional, district, sub-district and community level of health care. Transport has been identified as an essential resource and vital tool of the delivery of health services. The *Transport Management System* of the GHS covers five components⁷:

- *Policy Framework*
- *Operational management*
- *information Management*
- *People Management*
- *Fleet Management*

Guidelines for procurement, operation, maintenance, disposal and replacement are already in place and well communicated to the regional and district levels. A transport office is established at the regional level. Transport officers are in place at all district levels, inventories were available at each of the visited health locations. The GHS is committed to preventative vehicle maintenance and has developed a Zero-Breakdown-Modular-Maintenance-System (ZBMMS) for motorcycles in health care.

This system is used in a number of regions and has already increased life expectancy of the vehicles from 3 to 5 years statistically.⁸ ZBMMS also grew from the "Moped-Disaster" in the nineties, where light and miniature motorbikes were procured for service delivery without any maintenance system and rapidly led to a massive breakdown of these vehicles (of which none is used anymore).⁹

⁷ Ministry of Health: Transport Policy Ghana, Accra 2004 and Ghana Health Service: Transport Policy, Accra 2003

⁸ Transport Management Bulletin , GHS Issue 1, Accra, April 2004

⁹ Transport Management Bulletin , GHS Issue 1, Accra, April 2004

The MOH has also developed minimum vehicle mixes (“Transport Portfolio”) for the different health levels and providers, including boats and bicycles:

National Model of Transport Portfolio¹⁰

Regional Hos- pital	District Hos- pital	Sub-District Health Centre	Community level (CHPS Zone)
1 Saloon Car 1 Ambulance 1 Minibus 2 Pick Up 5 Motorcycles 1 Bicycle	1 Ambulance 1 Minibus 2 Pick Up 1 Motorcycles 1 Bicycle	2 Motorcycles 1 Bicycle	1 Motorcycles 5 Bicycles

GHS is intending to test new vehicles in service delivery like tractor-driven ambulances and motorised tricycles (see chapter 9).

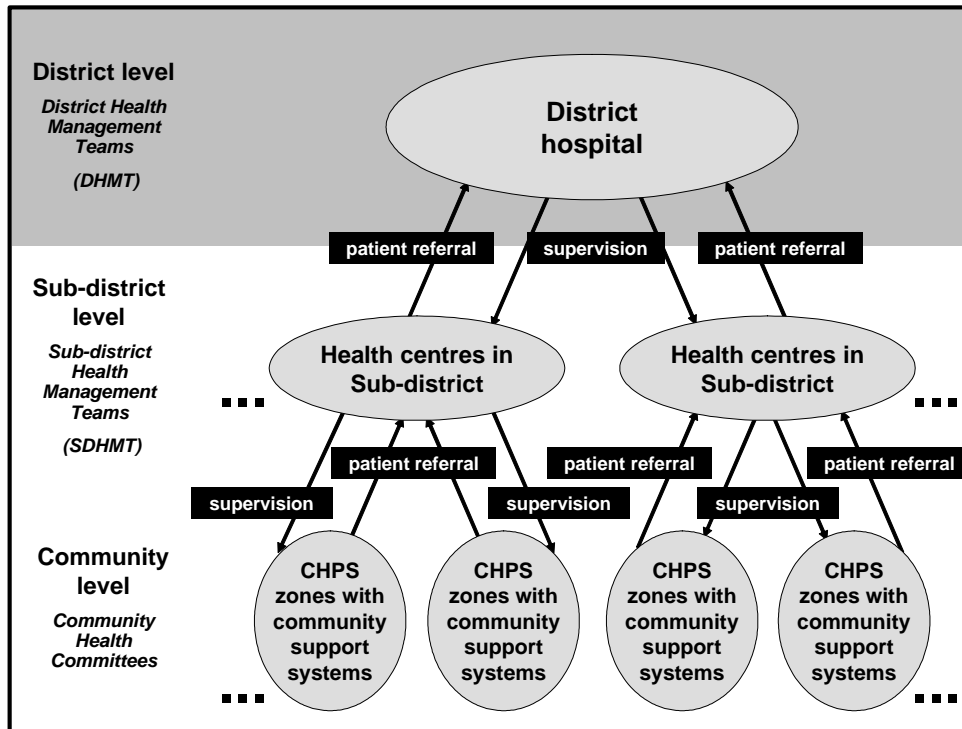
According to the internal ministerial skills, it can be concluded that the high level management of GHS is already able to introduce a sustainable transport management system by theory and communication structures in the health sector are well developed. A comprehensive methodology of analysing the internal issues (physical-, human- and financial resources) and external issues (environmental, geographical, demographic, infrastructural and health related factors) is already developed. However and as shown below, the government is not able to perform the results of this analysis on the ground.

¹⁰ Ministry of Health: Transport Policy Ghana, Accra 2004 and Ghana Health Service: Transport Policy, Accra 2003

3.4 Organisational Structure

In relation to the administrative structure of the country with 10 regions, 138 districts and sub districts, the organisational structure of the national health care system in Ghana includes a hospital on the regional level. Below the regional level, the rural health care is divided in three levels:

1. District Hospitals
2. Sub-District Health Centres or Polyclinics
3. CHPS / Community Level



At the CHPS zones on community level, a small health point is located in one village, covering several (5-10) villages. Here in the best case, the Community Health Officer (CHO) is assisted by a professional nurse, an auxiliary nurse, midwives and one or two volunteers (CHV)). However, there are only few CHPS zones established yet.

Communities – of which most villages squattered widely - are in most cases without any health facility. They have at least a (male) volunteer, who does work under supervision of the CHO or the sub district. Some villages have a (male) health volunteer, seldom both a female and a male volunteer.



Characteristic for Northern Ghana: Due to a low population density, most villages have no own health facility (photo: Heyen-Perschon)

3.5 Problems in health organisation and logistic

In service delivery and organisation of the rural health sector the following problems were prioritised:

- **Lack of personal and health facilities:**

...Population/Doctor Ratio worsened: 17489/1 national average (Northern Region: 76080/1)

...Population/Nurse Ratio worsened: 2598/1 national average (Northern Region: 4070/1)

...Outpatient visits worsened: 0,50 per Capita national average (Northern Region: 0,27)

Due to this lack of available medical personal, volunteers often are identified as medical personal ("Local Doctor"). In emergency cases they often give wrong advice, which causes fatal cases (see also below).

- **Lack of motivation of highly educated medical staff to work in rural regions** – especially of those in the northern parts of Ghana
- **Increasing internal staff flow within the rural health system**
- **Though CHPS reform is in place:**
 - a) *Limited efforts of identifying needs of poor households*
 - b) *Limited efforts of identifying needs¹¹ of health workers in deprived regions (CHOs, health volunteers, TBAs, native doctors, herbalist)*

¹¹ DfiD-Study need-indicators: accommodation, water, electricity, transport, links to and from the district, access to good schools

- **Transport guidelines are only in place by law, not by fact**

The situation in the selected pilot area of Northern Region proves that the model of minimum vehicle mix for the different health levels is not in place on the ground:

- ? *A second 4-wheeled Ambulance is not existing (Saboba District)*
- ? *A Minibus is not existing (Savalegu District)*
- ? *Community Health workers are not all equipped with motorcycles (all levels)*
- ? *Motorcycles are 8 years old or even older, breaking down in dense intervals (replacement should be after 5 years /all levels) – ZMMBS not working*
- ? *4 of 4 motorcycles in a sub-district in Saboba health centre are out of order – the only working motorcycle was owned by a the nurse*
- ? *Bicycles are not accessible at the community level or out of order (replacement should be after 3 years)*

The aging vehicle fleet (average age of a motorised vehicle in 2000 was 7,7 years) has already resulted in increasing fuel consumption and repair/maintenance costs of these vehicles and will put high pressure on the transport budget in the coming years.

4. Non-governmental actors

In addition to the governmental health care system, the church is playing a mayor role in Ghana. CHAG – Christian Health Association of Ghana – is the umbrella organisation that co-ordinates the activities of the Christian health institutions and churches' health programmes in Ghana. CHAG is co-ordinating its programmes with the Ministry of Health and GHS. The members of CHAG predominately focus on the poorest and vulnerable groups and is therefore often located in the most remote areas of the country.¹²

Though CHAG is the only relevant health NGO in the country, CHAG's position in the health sector has deteriorated since the organisation more and more faces other NGO's competing for government resources (*Safe The Children Fund, Health Professionals for Health, Youth Against Aids, World Education and ProLink*)¹³.

Recently CHAG lost influence in government policies, could not perform to meet the expectations of its members and therefore had almost completely lost confidence in the Secretariat. Since 2004 the situation seems to improve again.¹⁴

CHAG's mayor area of work is outreach and home-based care, done from their 58 hospitals and 90 health centres in the country. The organisation concentrates on childhood and mothers diseases as well as on HIV/Aids.

¹² Main CHAG member institutions are Anglican Church, Catholic Church, Seventh Day Adventist Church, Presbytenan Church, Salvation Army, Church of Pentecost

¹³ These organisations delivered bicycles for Aids campaigns, health education and outreach-however an evaluation of their activities was not available

¹⁴ Christian Health Association - Annual Report 2003/2004, Accra 2004

According to the view on transport in the work of CHAG, it was mentioned, that 30% of the population cannot be reached by the CHAG health workers due to lack of access and distances up to 25km between villages and the next health facility.

Though it is an independent health organisation, GHS- and CHAG-institutions are closely linked in rural health provision and are de facto fully integrated in the national health system. There is no present competition between CHAG and GHS: Either a district or sub district has a CHAG health facility and is substituting a GHS facility.

5. Experience of transport related health projects

5.1 Bicycles for Health Volunteers

In the Kassena-Nankana-District (Volta Region), volunteers were equipped with bicycles and basic drugs for treating minor ailments. This mobilisation of community volunteer operations was believed to improve health, but the initiative had both positive and negative impact¹⁵:

- Where alone volunteers provided care, children in the second year of life experienced double the mortality rate compared to prior to the intervention
- In regions with an CHO, children aged 2 to 5 faced about a third less mortality than before and in the later years the benefits are even greater

The background for these ambivalent effects are general lack of credibility and skills of the volunteers to work as health care providers. Mothers of young children simply got the wrong treatment and/or advice as in the second year of life, respiratory infections are an important cause of morbidity and these children were not referred to the next clinic in time.

Another factor is the traditional culture of decision making within a rural household, leading to fatal delays in seeking effective care. Men are usually taking the decision if a child has to be provided with health care. Here, volunteers might have not enough standing, reputation and credibility to convince the compound head. The same is for delays through herbal treatment and consultations of native doctors, often chosen as a first and low-cost option of treatment due to the usual household's financial constraints.

5.2 Radio Communication in Health Provision

In the Volta Region, an ODA assisted health project was carried out 1993, providing regional and district health administrations received two-way static radios (Motorola, solar energy driven) to link each other and minimize their previously frequent travel. The outcomes of this project were:

- District could avoid unnecessary travel and now not longer come to the headquarters just to be disappointed of shortages
- Districts were enabled to make savings on their budgets, spent for other programmes
- Information and communication process was enhanced
- Management efficiency was accelerated (improved guidance of performance in the sub-districts)

¹⁵ Source: Navrongo Health Research Centre: Bicycle with a flat tyre. NHRC Report Vol.4, No.10

- Radio has effectively supported the health activities within the district
- Utilisation ratio was high (85%)

Regular maintenance, training of radio operators and well kept logbooks were mentioned as key success factors of the project.

It was recommended that more could be achieved if the radio can be installed in the sub-districts and even on the community level to link them with the district/sub-district. Here, radio communication technology could be used to improve referrals and patient management.

6. Access to health services in rural Ghana¹⁶

Use of health facilities in Ghana is still low. Assistance in birth delivery proves the insufficient delivery of health care: Whereas 79% of births in urban areas are supervised by a medical practitioner, the rural figure is only 33%. Here, 36% of births are supervised by midwives and the remaining third is unsupervised. In some regions in the north, unsupervised delivery is the norm.

70% of the poor population is citing costs as one key reason for non-use of medical services. This includes cost for medicine, treatment but also transport to and from the facility. In addition to this, physical location of health facilities does not meet households needs, meaning distance as a major obstacle to the rural population. Up to 70% of the rural poor needs more than 30 minutes to the next health facility. But this reflects only the portion of the rural population consulting medical personnel. The assumption, that access is a main bottleneck of health care is proved by the fact that more than the half of the rural population (55%) is not consulting medical personnel.

As in most other African countries, the rural population is relying on walking as the dominant mode of transport. Animal drawn modes of transport are playing no significant role in both rural and urban transport. Only a minor number of donkeys is used in agriculture and marketing in the northern part of the country. Horses only play a reserved role in traditional village ceremonies in rural Ghana.

Bicycles are common in the country – especially in the northern regions. A cycling culture is existing. Available are Indian made *Phoenix* bikes and an increasing number Japanese of second hand bikes (with female frame design) as well as second hand mountain children bikes. With regard to bicycle ownership, there are no data existing but due to informal interviews, the density of bicycles seems to be still low in rural areas – an estimated 3% of the population own bicycles in the visited regions.

For health care, 32 (GHS owned) motorised boats are used in regions in riverine regions, especially near the Volta River (since 2000; DANIDA funded).

It should be mentioned that approximately 70% of motorcycles for the community level are used by female CHO.¹⁷

¹⁶ Source: Ghana Poverty Reduction Strategy 2003-2005. Volume 1, Accra 2003

¹⁷ Interview with Dr. Nyongator, National Director GHS PPE

According to the use of motorcycles in general and the assumption that utilisation rate is not sufficient, the prior problems are:

1. Lack of short-time access to genuine parts
2. High running costs, increasing with age and bad road conditions (fuel)
3. Time consuming travel conditions

Availability of motorbikes in working order therefore is low as already explained above.

For 4 wheeled vehicles, it was found that the number is not reflecting the GHS-proposed vehicle mix. Hence, these vehicles are used intensively. The ambulance of Savelugu for instance travelled nearly 16000km in 2004. Quality of cars is another relevant factor. The recently procured Mazda 4-wheeled pick up was found as too weak and was not used for rural trips to remote areas. It is the youngest vehicle in the transport fleet of Savelugu but already brings the biggest problems in maintenance.

It should be mentioned that some emergency cases within remote villages are reported by men, coming to the sub district or CHPS by bicycle. However the number of these cases could not be calculated.

**Example for financial constraints:
*The case of Tibabe***

Limited access to financial resources forces patients to stay at the health centre until a relative or friend pays the costs for treatment. The young boy *Tibabe* (see photo on the right), has been bitten by a snake and got an injection for cedis 400 000,- (50.- US\$): The mother (the father was dead) stayed for more than two weeks at the health centre, waiting for somebody to pay the treatment (the ITDP team paid the invoice and *Tibabe* and his mother could go Home).

(photo: Heyen-Perschon)



7. Selected region and districts to start with an intervention

As explained above and proved by the statistical analysis, the Northern Region – with 18 districts and 70 sub districts - together the Central Region are the most deprived regions in Ghana, considering poverty indicators in general and health indicators in particular. Northern Region was were chosen as an area for intervention.

The health facilities of the nearly 5000 communities in the Northern Region are low equipped, staff is lacking and also low paid (appr. 600-800 000 Cedis / 55-75 US\$ per month, increased by 30% for working in deprived areas). 50% of these communities are far apart and completely inaccessible for nearly half of the year (!) – during and after rainy season.¹⁸

In numerous sub-districts, a typical health centre has to cover several communities but is only consisting of 1 midwife, 2 nurses and no (!) medical personal.

During our interviews in the Northern Region, the responsible administrations stress marked the urgency of improvements of the mobility situation in the health sector.

“Your approach is the good news for our region!”

was more or less the first reaction after the introduction of the ITDP project. This was followed by an impressive description of the problems in service delivery due to transport constraints and geographical conditions. In addition to that, the interviewed health directorate in Tamale gave the feeling to be treated unfair by the national government in terms of vehicle procurements compared to other regions in the north (Upper East and Upper West). The last procurement of (140) motorcycles was in 1996 – means most motorcycles are nearly 9 years old.

Due to the demand, analysed in the next chapter the selected and proposed areas for interventions are:

Northern Region I:

**Saboba District
Wapuli Sub District
Gbangbanpon CHPS Zone**

Northern Region II:

**Savelugu District
Diare Subdistrict
Pigu and Tampion CHPS Zones**

The doctor/population ratio in Saboba is even worse than in Northern Region on average: 1 doctor is covering 108000 inhabitants. As in many other regions, several communities are inaccessible for 3-5 months during rainy season.

¹⁸ In 1999 some areas in the regions faced cholera epidemic. Three community health volunteers from a district tried to swim trough the floods to access the next district hospital in order to inform them about the cholera epidemic. Only one of them survived. Because boats are not appropriate for these flooding rivers, the regional headquarters took their aircraft to resolve the fatal situation. However today, this aircraft is not existing anymore.

7.1 Specific rural travel conditions in the selected regions

Though cycling is common in the country and especially in the north, the appropriateness of bicycles in health care provision is not clear due to the geographical conditions and the experiences mentioned above.

Professional health personal often is equipped with motorcycles (e.g. the CHO) and would not accept a shift to (California) bicycles. However, the specific environmental and infrastructural preconditions in northern Ghana affect also comfort, acceptance and effectiveness of use of motorcycles in health care delivery:

- ✍ Heat (in dry season more than 40degree)
- ✍ Harmattan sand-storms
- ✍ Great distances between villages and health facilities (up to 35km from a health facility to a remote community)
- ✍ Muddy road conditions after heavy rainfalls causes delays, accidents and defects
- ✍ Some areas are completely cut of the country for 2, 3 or even 5 months a year (!) (esp. riverine communities)

Additionally the adoption of the CHPS system and increasing demand for better quality of services (population growth is 2,9%¹⁹) are further factors, putting high pressure on the community health care providers as well as on the aging and inadequate fleet of vehicles.

7.2 Main health activities within the rural communities and related problems

The main duties carried out by rural health workers are:

- CHO:
 - monitoring of children's and babies health
 - first aid
 - malaria-, parasites- and diarrhoe-treatment and minor/simple treatments with medicaments (if available)
 - organisation of medicaments from sub district
 - advise/decision for transfer to next health facility
 - organisation of transport for referral
 - training at sub district or district

The CHO normally starts early in the morning to reach the far apart communities before the heat of the day and arrives back at the CHPS around 5 p.m., where generally 2 or 3 patients from the village, where the CHPS is located are waiting. The CHO is on outreach 5 times a week and covers an area of a circle of 20 to 35 km around the VHPS health point. All CHO's are equipped with a motorcycle²⁰ which normally is of high age (above 6 years) and often has defects.

¹⁹ Fischer Weltallmanach 2003

²⁰ Concerning the current delivery of motorbikes in the Northern Region (some few donations are coming from UNICEF or WHO) the procurement has now shifted from Yamaha to the Chinese made Jialing. Though Yamaha was highly appreciated among the users, this decision was taken by the MoH - probably because of lower prices.

In rainy season, the CHO cannot reach numerous communities due to flooded areas. Female CHOs always travel together with a male CHV.

Transport of equipment

CHOs face increasing volumes to be carried to the villages (equipment, drugs, bandages, weight controllers, vaccination coolers). However, as the CHO is always going with the volunteer (he has to carry a rucksack) on the rear seat of the motorcycle, the loading capacity of the vehicle is quite limited and overloading worsens travel speed, comfort and safety significantly (esp. after rainfalls).

- midwife:
 - o assistance in birth giving in unproblematic cases

The midwife is working on demand within the village and is an experienced elder women. She is active between 10 and 20 times a month and covers walking distances up to 2km within the community. She has no access to any vehicle.

- community health volunteers:
 - o health promotion, information and mobilisation of the community, education and sensibilisation (e.g. nutrition, immunisation, HIV/Aids prevention)
 - o vaccinations (during national or campaigns)
 - o disease control
 - o assistance of CHO in immunisation and vaccination programmes

The CHV is working on health care and promotion issues approximately 2 times a week. Though he or (seldom) she is no medical professional, he is the only medical person for or at least identified as a medical person by the majority of the rural population.

According to the effectiveness of his health advise and influence of the CHV, the traditional way of perception of community problems has to be considered and may limit impact of their potential in health care: Religious leaders and village chiefs are the opinion leaders in a village. As a consequence, the position of a health worker can be either high or low. They are either trusted or mistrusted, also depending on the original region the health worker is coming from and the understanding he or she has of the “endemic” village culture.

Transport of patients

Though there is a high demand of patients referral from villages to health facilities or from health point to sub-district/district hospitals indicated in the interviews, carriage of patients on motorbikes take place only 2-4 times a year. In these cases, the CHPS-volunteer has to organise his own transport back to the health point. In most cases patients in remote areas cannot be referred and lack adequate treatment. In emergency cases there is normally no transport option existing for a significant portion of the rural population of the Northern Region. Due to the settlement structure and the long distances, the CHO and the sub-district do not realise any case of emergency.

Lack of communication

Communication is mentioned as an option to improve both treatment and patients referral. But only in a few health points and sub-districts, solar- or electricity run radio phones are assisting in health consultancy and emergency calls. In these regions, effective phone treatments can be done and substitute a number of trips between health point and sub-district or district.

Gender related aspects

Women in rural Ghana are used to the bicycle and the Japanese second hand bicycles with female frame designs are chosen by women predominately. However only few seems to have access even if a bicycle is available within the household. Especially for female headed households the bicycle could assist in reducing mothers transport burden – and also includes potential for children’s health as they can be brought to the next health facility – if not too far.

For health car provision, the Saboba District is suggested also as a pilot area for introducing the California Bike for volunteers. Here, both female and male volunteers are working in the communities.

The design, frame and size of the California Bike was judged as appropriate to involve female health workers in this region. It is generally common for women to use a bicycle and they learn cycling during childhood.

Though most women prefer the female frame types, they are sometimes seen on *Phoenix*-bicycles with male frame-types. For the use of the *Phoenix* bicycle, the women tie the tale and the traditional wear with an additional cloth. Precondition is, that the female health workers are not too old for cycling, which is the case in these communities.

*Contribution to children’s health:
Mothers can bring their sick child
to the next health facility - in most
cases on Japanese second hand bikes
(photo: Heyen-Perschon)*



8. Possible role for appropriate transport technology and transport-related communication systems in rural service provision

8.1 Integrating a system of communication and transport

On sub-district and on the community level, transport is the main constraint, accompanied by lack of possibilities of patient's referral and communication to the sub-district and district. The mayor non transport related problem is the financial accessibility of treatments and medicaments.

As already described, the key focus of governmental activities is on the CHPS / community health work. In line with the national health agenda to focus on the community health and patients referral, a possible intervention for solving transport problems in health care on these both levels is...

...to provide a integrated system of communication, mobility of CHO and CHV as well as the transport and referral of patients.

8.1.1 Strengthen the community health volunteers with California Bikes

At the village level, bicycles are expected to influence health promotion by volunteers and should be implemented here. To date 90% of the cycling health workers are male. The overwhelming majority of them is depending on walking though being responsible to cover several villages. Only those CHV, working at the health point, are using the *Phoenix* bicycle. In emergency cases, a CHV could try to access the next health point to inform the CHO. However, this will only be expected in a limited number of villages, where distances are acceptable.

The CHO him- or herself would neglect to use a bicycle as his reputation would be affected and his distances are also not with the reach of a bicycle. As a side effect, the image and reputation of the CHV within the CHPS system could be raised when owning a bicycle as most households don't have access to a bike.



Option I: The California Bike (here at the IBD Shop in Tamale)

The number of CHV, where a bicycle is expected to assist in their daily work is high. In Saboba district only 33 of 480 CHVs have a bike (7%). It is suggested to provide 5 female and 5 male CHVs with bicycles – also to compare the use from a gender perspective. For Savelugu district the situation is comparable. Here 7 communities are selected to receive bicycles for their CHVs (only men).

8.1.2 Strengthen the community with a bicycle- or a donkey ambulance

A bottleneck is the referral of patients from the community to the health point and further on to the sub-district. Here a donkey- or a bicycle ambulance might help the community to react in emergency cases to bring sick people to the next CHPS health point.

Some areas of the selected sub-districts are flooded during rainy season for a longer period of time. Here the donkey was said to be most appropriate to cope with the travel and surface conditions.

A donkey drawn ambulance would be appreciated by some communities as their areas are partly flooded during rainy season and therefore have no access to the main road (6km) and to the 21km far CHPS for at least 4 months a year (Savelugu district).

Both donkey and bicycle ambulance shall be located in and owned by the community itself, that takes care and maintenance costs. It was said that once accepted the communities will find their own way to look for it. It is necessary to stress mark the use limited to health care issues and will be supervised by the CHO.



Option II: The FABIO made bicycle ambulance
(Alternative: donkey ambulance)

8.1.3 Strengthen the CHO with a communication system

On the level of CHPS, district and sub district, radio communication was seen as an effective mean to improve both information flow, service delivery and patients referral logistics. Phone based treatment can avoid transport need as proved in the project, mentioned earlier. In both selected regions there are numerous communities being cut of the rest of the country for several months a year due to flooded areas and phone-based medical treatment might be the only option for that period of time.

In Saboba district a Motorola radio communication system is already in place on sub-district level and therefore could be equipped with a comprehensive communication system form the lowest level on. 3 CHPS Zones could be equipped (Wonjuga and/or Demon and/or Bumbrug) as well as the Health Directorate at Saboba, whose system is broken.

In Savelugu district and Diaré sub-district the system is also in place. To complete the envisaged information chain, it is proposed to provide the system to 2 CHPS zones (Pigu and/or Tampion) and – in order to get the medical professional informed - to the 4 wheeled driven ambulance of the district. The latter is proposed because the medical doctor, whose assistance or at least advise may be desired, often is on outreach and not accessible by a mobile phone.



Option III: Radio Communication (here at Saboba District Hospital)

8.1.4 Strengthen the CHO and the sub-district with a motorcycle ambulance

Improved and quick referral (emergency cases) from the CHPS health point to the sub-district clinic is expected to have a significant impact on chid- and mothers health. The distances and road conditions are appropriate for a motorcycle with a trailer and could fill this gap in the transport chain from the village to a hospital. The ambulances have to go via the main road and therefore requires high visibility and a horn.²¹ It was agreed that fuel and maintenance costs are taken over by the district/sub district.

²¹ The option for patients with emergency cases, one having reached the main road to hire a private vehicle would lead to extremely high expenses for the last part of the referral: 400 000 cedis would be necessary in the studies regions, probably taking the funds for treatment and medicaments

As a side effect it might also be also possible to improve health care in some villages directly because the CHO then is able to transport extended, heavier health equipment to the villages.

This is the case in Savelugu district for 2 CHPS zones in 2 sub-districts (SD Diaré with CHPS Pigu and SD Nanton with CHPS Tampoin).

For Saboba district, motorcycle-ambulances should go to CHPS Gbangbanpon and CHPS Demon.



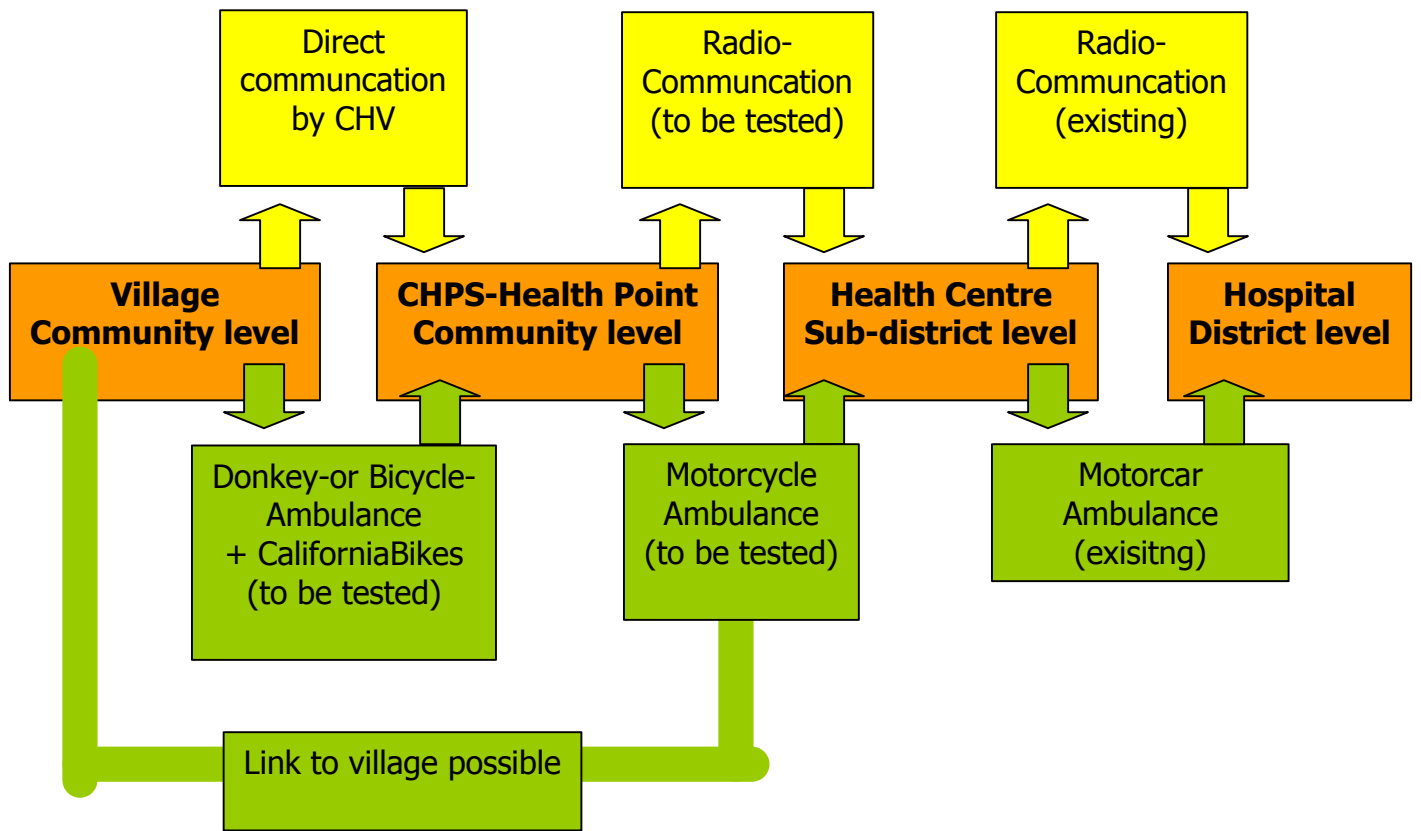
Option IV: Motorcycle ambulance

(here a prototype to be prolonged and equipped with a roof an alarm)

Ownership

To motivate both users and the communities and sub-districts and to assure sustained vehicle maintenance, the idea of a promised ownership of the test-vehicles after a certain period of time of debreviation (e.g. 2 years for a bicycle, 3 years for the mobile phone and 3 years for the donkey and ambulance trailer) was judged as effective but has to go conform with the national transport policy regulations and therefore will be discussed before the trial fleet is delivered. An agreement with the users will be made at the day of delivery (attached).

**ITDP approach:
Integration chain of communication
and transport in rural health care**



Female community health officer and one of her 12 CHV to receive California Bikes (Savelugu District / Northern Region; photo: Heyen-Perschon)

.9. Interfering projects: Linking ITDP intervention with GHS trial fleet

There are no interfering projects identified within the envisaged pilot sub-districts.

However, the headquarters of the Northern Region is planning to test tractor ambulances and “Baja”-motorised Tricycle ambulances from India in patients referral this year in some neighbouring sub-districts.

Both vehicle types will be introduced in the Saboba District (the tractor ambulance to Chereponi sub-district, the Baja tricycle to Wenchike sub-district) within 2005.

The Ministry expressed its interest to evaluate the effectiveness of the vehicles introduced. ITDP was asked during the interviews for taking up activities in this direction. Because the vehicles will be working in some of the sub districts and the ITDP interventions will work in neighbouring sub districts, it is proposed to analyse the impact and acceptance of these vehicles during the second phase and compare with each other.



***The tractor-driven ambulance-
one of the new vehicles, tested by the Ghana Health Service –
its impact to be evaluated by ITDP***
(photo: GHS / not shown: Indian Baja-Tricycle)

10. Technical specifications for the interventions

Motorcycle-ambulance

The motorcycle-ambulance will be based on the Chinese made Qingqi QM90ZH. It has to be prolonged by 50cm, equipped with a roof and a alarm horn. The bike ambulance trailer will base on the Ugandan (FABIO)-design and the donkey ambulance shall base on the local common donkey trailer.

Bicycle- and donkey-ambulance

The final designs for the ambulance trailers (both motorcycle-, donkey- and bicycle-ambulance will be discussed between the manufacturer (IBD Tamale), the district and ITDP. It is of importance to recognise the travel conditions during rainy season for the tires, spokes and especially for the height of the trailer above the (flooded) travel path.

California-Bikes

The IBD will subcontract local blacksmith to manufacture carriers for some (6) of the CaliBike as the existing ones are not appropriate for patients transport. A cushion and footresters will supplement the carriage system of the bicycle.

Communication technology

One existing problem is that different systems are in place because they are coming from different partners (UNFP, UNICEF, WHO). Some sub-districts have to make a complicated, time consuming triangle call to reach the appropriate health facility. Therefore - and before procurement - of the technology, the compatibility of the available systems with the existing ones has to be clarified by ITDP Ghana.²²

²² donors and international health partners are not taking care of making communication technology compatible, which causes needs for making cross calls via other stations, delays oin communication and information,as well as in maintenance problems.

11. Selected Interventions by District

The Identification of levels and areas for interventions is based on the transport needs assessment done during the site visit. According to this and summarising the above we suggest the following (the suggestions in brackets are requested but not absolutely necessary for testing a trial fleet):

Saboba District (Northern Region)

- 10 California-Bikes to CHVs of CHPS Demon (3 of them are equipped with a carriage system)
- 1 communication system to the CHO of Demon
- (1 communication system to the CHO of Wonjuga)
- (1 communication system to the CHO of Bumbrug)
- 1 communication system to the Health Directorate at Saboba
- 1 motorcycle-ambulance to the CHO of CHPS Demon
- 1 motorcycle-ambulance to the CHO of CHPS Gbangbanpon

Savelugu District (Northern Region)

- 7 California-Bikes (3 of them are equipped with a carriage system) to CHV in CHPS Pigu
- 1 bicycle-ambulance to one community in Pigu CHPS Zone
- 1 donkey-ambulance to one community in Pigu CHPS Zone
- 1 motorcycle-ambulance to the CHO of CHPS Pigu
- (1 motorcycle-ambulance to the CHO of CHPS Tampoin)
- 1 communication system to the CHO of CHPS Pigu
- (1 communication system to the CHO of CHPS Tampoin)
- 1 communication system to the mobile medical doctor of Diaré sub-district

12. Introduction in vehicle technology, maintenance and ownership

On the day of delivery/official hand over of the vehicles, the ITDP team, assisted by the IBD will give an introduction in the main technical issues and in usage and general maintenance of the vehicles and the communication technology. For the communication system, the district will teach the CHPS and the sub-district on use and maintenance.

For the California Bike, minor maintenance will be shown by the IBD. He also will train 2 or 3 local mechanics in mayor repairs some weeks before the delivery. The mechanics will be invited to take part at the official hand over so that they become known as the ones who are experts in CaliBike repair.

Further on, the logbooks will be presented. They shall be supervised by the next level health officials:

- for the Cali Bike and the two non-motorised ambulances this is the CHO
- for the motorcycle ambulances this is the sub district and district
- for the communication system this is the sub district and district

Finally the agreement will be signed by the regional, district and sub district officials as well as of ITDP and the users themselves. The media shall be informed to report about the project. The place of delivery will be either the district hospital.

The date of delivery is planned for early June 2005.

13. Next Steps (2d Phase)

The next visit to Ghana is planned for October 2005 to do the final evaluation and also to start to design appropriate methods to access the problem better, based in the experience made within the first pilot phase. This will include the involvement of the private sector in Tamale (including the IBD Tamale) on producing trailers for ambulances as well as the producers and distributors of Radio communication systems in the country (Motorola, WHO, UNICEF).

The evaluation itself will imply informal and formal interviews with the users of the different ITDP interventions and the two GHS interventions (Baja and tractor ambulance). This is the most important part to raise data for qualified and quantified results. The collection and analysis of the Log-Books, distributed among the users at the beginning of the project will support this. We also will have a direct investigation of the donations we gave to see, if the user still owns them and how intensively the donation has been used to date.

An evaluation report will be written and - basing on this - we will finally discuss wit the relevant stakeholders (esp. GHS) further steps of how to support the partners with a full fleet of “redesigned” means of intervention.

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