

CLINICAL TRAINING FOR TROPICAL DOCTORS IN THE NINETIES

by

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Summary — Together with economic causes, the declining belief in the relevance of clinical skills, the omission of the hospital from the health system, and the erroneous generalisation of a complaint centred approach enhanced the decline in clinical medicine in several developing countries over the last decades. Despite a growing interest and important efforts in continuous education, basic training remains generally knowledge-directed.

Clinical training should start from a realistic job description, and aim at acquiring skills instead of knowledge. Basics of clinical epidemiology can help refine clinical logic both at the health centre and the hospital level. The district hospital should be awarded a key role in pre-graduate and continuous clinical training.

Awaiting a revival of the economy in most tropical countries, and especially in tropical Africa, an effective way for improving clinical practice is to invest in training, at all levels, with an emphasis on continuous medical training.

Introduction

Training in clinical medicine should take into account the specific environment in which this medicine will be practised ultimately. On the other hand, clinical medicine has deteriorated substantially in some developing countries, almost dramatically in several sub-Saharan countries, over the last decades. We will first present an analysis of the environment in which tropical medicine is practised and of the presumed causes of this decline, before discussing proposals for present and future training.

A specific environment

Tropical clinical practice depends highly on geography, as the mixture of diseases differs substantially from place to place. In many tropical countries, prevalences of diseases vary between places a few hundred miles apart. This is unlike medicine in the Western world, where the array of diseases differs little between e.g. Canada and France.

A different cultural approach to health and disease requires a different management of the patient. But also a different appreciation of "authority" has an impact on career building and willingness to improve. In the western world, "authority" has changed a lot during the last decades: from "someone who knows everything in a given field", it changed to a more modest image, "someone who follows closely a given field, and who is able to find the reference or the person who knows more on a subfield". In many developing

countries, a doctor remains an “authority” in the former meaning, hampering thereby continuous training. The way people learn in general is also highly determined by cultural differences. The culture will have a definite influence on the “climate of medical education environment” (4).

The economic context is different from Western countries: the rich part of the world can spend any amount of money for the slightest suspicion of disease, and for therapy with a small marginal benefit. In tropical countries the absence of sophisticated diagnostic tools makes that correct diagnosis relies highly on personal examining and thinking skills. On the other hand, the utility of clinical skills is enhanced by the fact that, at least at the secondary level, the patients often consult at more advanced disease stage, with more prominent symptoms and signs.

In the seventies and the eighties the primary health care philosophy was developed: preventive and clinical medicine should be integrated in a decentralised structure. Its development requires commitment and co-management of the population. The integrated health system encompasses the district hospital and the health centres, and is directed by a district team. First and second line rely heavily upon each other, for patient care, training, motivation, management and finances. Bonds with, and access to third line medicine are heavily jeopardised by distances and financial barriers: this fact forces the district to be self-sufficient, financially and scientifically.

District doctors work in a team, in which responsibilities and a lot of competencies are shared: this is quite different from most western health systems, where general practitioners have only a formal contact with specialists. They cannot be seen as a “health team”. To work in a team necessitates special training, skills and attitudes. Clinical practice is not so subspecialised as in Western countries. In various countries tropical doctors are polyvalent: they function as physician, surgeon, obstetrician and manager at the same time. Moreover, in many regions clinical medicine is practised by nurse-practitioners, with a low basic knowledge.

The decline of clinical medicine

Visiting young doctors and nurses in the field is disappointing, especially for their former teachers: instead of finding good performers one finds people struggling with scalpels, forceps, broken microscopes, photometers and x-ray tubes, limiting progressively their diagnostic horizon to an average of 15 to 20 different diseases.

Often, economic factors are incriminated as the major cause of decline of clinical medicine in tropical countries. Diminishing supplies in drugs, laboratory equipment and reagents, imaging equipment and logistics, access to literature, all contribute to the breakdown of armamentarium for practising. The effect of economic restraints on teaching and training, which adds to a decline in clinical practice, is also unquestionable.

On the other hand, modern technology has destroyed the belief in the value of clinical history taking and physical examination. It is as if scientific medicine did not exist thirty years ago. The majority of western doctors are not able anymore to recognise and to interpret a fixed splitting of the second

heart sound (if anyhow they know what it means). The earlier presentation of the patient in the course of the disease makes symptoms and signs less prominent and thus less useful indeed. This world-wide diminishing belief in clinical skill is discouraging tropical clinicians, while it is felt even in the most remote parts of the world.

In the sixties and seventies public health took on enormous flight. For some schools, and for many medical practitioners, the concept of public health was ambiguous or was erroneously understood: it was as if medicine relied only on prevention, as if clinical medicine was not a part of the public health structure, and as if they were separate disciplines (12, 14). Of course, this is a very narrow concept of public health, which clearly should include adequate curative medicine.

In the same decades, the medical world became aware of a different clinical logic for the primary and the secondary tiers of the health system. It was acknowledged that, at the primary level, a precise diagnosis is not required in most cases, that the patient's problem can sufficiently be managed on the basis of the dominant complaint. A scientific approach of this logic resulted in dichotomous algorithms or "strategies". In many parts of the world, the convincing evidence of the effectiveness of this reasoning was extended to the hospital, where one started to treat systematically complaints without diagnosis as well, with a deleterious effect on quality. It should be stated that algorithms have also a role in hospital medicine, for the solution of specific diagnostic questions and for management of diseases, once a diagnosis has been made. But solving complex clinical problems with a simplistic dichotomous approach, or treating symptoms one by one is deleterious for clinical medicine at the hospital level.

Analysis of the present training

Didactics

Training of medical doctors in tropical countries imitates Western universities (2). Knowledge is considered more important than skill. An unbelievable overshooting of storage of facts is the rule. Ex cathedra lectures are the cornerstone of teaching. Ward rounds in overcrowded and technologically depleted reference hospitals, and clinics without gold standard try to counterbalance this medieval didactic nonsense. University hospitals emulate western hospitals, while district hospitals took over "district" philosophy and integrated it.

In the last decade, the medical profession became aware of the paradigm "you never *are* a doctor, you always *become* one". World-wide efforts grew for continuous training. In third world countries, a continuous stream of seminars arose, as every organisation or programme has its own seminars. In some countries, the abundance of continuous training and the lack of coherence between it, incited medical personnel to complain of this real "seminaritis". In the beginning this training replicates, or worse, rehearses earlier training in universities, with an accent on knowledge, "always more", and listening. Organising continuous training in tropical countries is often hampered by a different meaning of "authority", poor financial resources,

absence of didactic objectives and tools, scarcity of literature, and the disbelief that continuous training means evaluation of competence.

Seminars have attracted widespread interest because they democratically redistributed program budgets to many health staff members, either teachers or trainees. Too often however, people attend for per diem, and not for content. It causes much absence from clinical work. What they learn, is often far from what they can practice. There is no formal integrating plan, and there is little feedback.

W. Van Damme discusses experiences with continuous training in his presentation about continuing medical education in Guinea. Although he observed an important progress in health services, he concludes that their way of training reinforced schism between public health and clinical medicine. (cf. Annexe 9).

General medicine

When we consider helminthology, parasitology, bacteriology and virology as ancillary courses of internal medicine, a tremendous amount of time is spent to this discipline. Teaching is predominantly passive and descriptive: only in the laboratory courses some skills are provided.

Principles of clinical epidemiology (pre-test probability, weight of arguments, marginal benefit) are not integrated in basic training. These principles are even more important in the uncertainty which surrounds the practice of tropical medicine. Without them, correct reliance on symptoms and signs is impossible, and the difference between first and second line logic is difficult to understand.

To define the weight of disease characteristics assumes research in an environment where a definite diagnosis can be made. Often these weights are not known for district hospitals, and they are erroneously copied from published research in a high technology environment, often in western countries, which promotes perpetuation of erroneous beliefs and wrong principles. Bedside training in underequipped hospitals (we mean hospitals where even a thick film for malaria is not available) can be dangerous, when clinical signs and symptoms are linked to diagnoses that have been made on the grounds of belief, not on grounds of proof.

Surgery and obstetrics

The majority of the students have little practice in surgery and obstetrics in third world universities. A full training in one of these two disciplines normally requires 5 years. Actually, undergraduate students can assist at some operations and deliveries, and can practice a bit themselves. However, appropriate training in both these disciplines in a short time requires a careful didactic plan and special didactic tools (cf. Annexe 25). Moreover, a short course does not mean some sessions of a long course!

Teaching

When we think of teaching in developing countries, we see tropical doctors teaching village health workers under a mango tree. We tend to forget that there is a lot of teaching on a much higher level, from nurse-practitioners to peers. Whereas recent advances in teaching skills have been introduced at the lowest level, teaching higher levels is still an imitation of our nineteenth century practice.

In contrast to other disciplines, teaching is never taught in medical schools: we are all supposed to be born as teachers (1). Moreover, we teach anatomy, physiology and pathology exactly the way we were taught, in an *ex cathedra* way.

Proposals

The time has come to rethink our teaching for developing countries, trying to incorporate advances of modern medicine in a hypotechnologic environment, and without creating that nostalgia for western standards, which is so common in the tropics, and which is transferred easily to local people.

Training what?

Modern clinical teaching should aim at transmission of skills and even of the art of medicine, adjusted for circumstances in tropical countries. Curricula and training plans should take into account the probability of ultimate effectiveness of the training, "the training objective's vulnerability" (6). Knowledge should be dispensed if it can contribute to better practice. Of course a lot of knowledge is required for insight in processes, and insight is required for a scientific approach to diseases. But for every branch of medical knowledge, its *relevance* should be evaluated.

We should prepare medical personnel for the job they will do: if nurse-practitioners will consult, train them in diagnostic logic. If district general practitioners will practice surgery, just train them also in surgery and let us not close our eyes. Too often academic decision makers and directors of national nurse training programmes do not take into account the final activities of their trainees: they emulate western training models, which are intended for a quite different job description, often far more specialised.

A training in teaching and organising continuous training and self-training should be part of all curricula.

Since a few decades, decision analysis has been introduced in western medicine to various degrees. We have learned that knowledge without art is senseless, and that the art can be analysed, calculated and so transmitted to students. We have also learned that too much knowledge can seriously hamper the student in making a diagnosis, if this knowledge is not digested in an analytic way (They behave like full hard disks, without a "disk-operating" and a "retrieval" system). The appropriate amount of knowledge should be offered together with a thorough course in clinical epidemiology. Gradually, a

problem-based approach can be introduced, and should conclude the training. Decision analysis should be applied to everyday situations, so that this scientific approach replaces the “intuitive art” of medicine with a “scientific art”.

During this training, students should become aware that clinical logic at the health centre is different from the logic at secondary level. Different approaches should be analysed and justified, so that they never will be imported in the wrong level. Where abdominal pain e.g. without other symptoms could be treated with an antihelminthic at the health centre, thorough history taking, physical examination, some laboratory tests and an ultrasound can be included in the work-up when the health centre approach has failed. Too often a complaint centred approach is the rule at the hospital level. From the scientific world, a major effort is expected for the necessary data for this training: likelihood ratios, as established and taking a substantial part in western algorithms (10), have to be determined in the field. Diagnostic algorithms have to be restudied omitting all modern technology.

Simple laboratory tests with cheap instruments and cheap reagents should be taught, shown and practised. Lack of specificity can be balanced by better knowledge of clinical epidemiology: students should be taught to start from a higher pre-test probability.

Training should take into account the specific circumstances in which tropical surgery is practised. With a minimum of instruments and material, a high degree of efficiency and efficacy can be obtained. Even standard western hygiene is not at all an absolute premise for good surgery.

Appropriate training in this discipline during undergraduate training is only possible with special didactics and didactic tools. Surgical dexterity can be taught (11), and by sparing several precious minutes, can help overcome one of the major problems in field surgery: lack of extended anaesthesia, which creates a lot of problems and even mortality near the end of all complicated operations. Training emergency operations is often hampered by the increased risk for the patient when the trainee operates himself. Preliminary training on cheap, locally constructed replica's allows gradual mastering of the skills.

In their presentation, Louffi et al. prove that a relatively short course of 6 months can yield satisfactory results (cf. Annexe 25).

In many countries, tropical doctors do not perform normal deliveries: when they have to practice obstetrics, it will be for complicated problems. Often, the approach of such complicated pathology is totally different from our western strategies: caesarean sections are extremely dangerous in case of infected uterus or exsanguinated patients, and forgotten techniques like symphysiotomy can be live-saving. How could we provide an adequate training? First by reviewing algorithms, second by teaching skills on replicas (not only “showing”, but practising), third by organising internships in “training district hospitals”, entities which are rare until now.

Especially teaching how to teach skills to people with low educational level could be very helpful, and should be integrated in the undergraduate curriculum.

Teaching clinical skills to the primary level needs awareness of the fundamental difference between primary and secondary level, between complaint-centred and disease-centred medicine. Some basics of clinical epidemiology can be helpful in understanding this difference.

Didactics for continuous training amongst peers are the cornerstone for quality in curative medicine. Mere discussion of cases is interesting, but not enough for continuous training.

Other didactics for continuous training should be developed and evaluated, although the latter is a great challenge. Locally adapted plans for continuous training could be set up and evaluated: the results of this evaluation could be of tremendous help for the future.

Training how

A lot of methodology has yet to be invented, that takes into account the scarceness of technology, the geographic pathology and the local cultural approach.

Problem based teaching became a trend in western, and some tropical countries (8). We are convinced that is not possible without, in addition, a thorough teaching in descriptive medicine, disease centred (9). Both can go side to side, but teaching of the entire medicine starting from complaints does not promote physiopathological thinking, and creates mere executives rather than analysers (9).

Courses should be planned, evaluated and readapted. Too often a course is an amalgam of lectures by a series of specialists, without internal consistency. Too often also, short courses mean some sessions of a different, long course.

If students have to be trained for emergency actions, simulations and replica's have their specific roles: they allow slow rehearsal of the action, with explanation and return to previous steps.

For diagnostic training, computer technology can be of substantial help (3, 13). Computers can simulate any presentation of any disease: they can guide the student through his logic. Computer technology should be used for the right purpose: only there where the computer has a huge advantage over man, should it be promoted. Mere hypertext cannot justify the expenses of hard-ware, soft-ware and maintenance that weigh so high on budgets. Only where a strong interaction, with correction by the computer, is possible, should we defend this technology (7). Otherwise we create false needs at a high cost.

D. Smith presents an "electronic book" about management of severe and complicated malaria. The question is, if such hypertexts will contribute to better management in the field with an acceptable cost/efficiency ratio. Although the Kabisa programme, a tutor for medical decision making at the level of a district hospital, presented by Van den Ende et al. is strongly interactive and promising, its effect on clinical skills in the field remains to be proven (cf. Annexe 26).

Training where

Training should be organised in the country. Training in western countries is deleterious: trainees see other diseases, other tools, other financial standards, an other rationale. Training abroad creates nostalgia for high technology, and for a high living standard, which promotes practice in bigger cities or migration to a western country, private practice and unaffordable fees. Training abroad should be reserved for specialisation or postgraduate training.

Undergraduate training and continuous training should always be in close contact with reality, having in mind that competence should be applied, should be build in a system or a structure, to result finally in *performance*. Continuous feedback between training and the health system would be interesting for both partners. Therefore, training in university hospitals should shift towards district hospitals, although we recognise the lack of “training district hospitals” that meet high standards. Of course, for reasons of procedure frequency, part of the training in surgery and obstetrics require large hospitals.

Pearson presents the 4-year Nigerian postgraduate FMCGP programme, where students are trained in “accredited district hospitals”. It is a post-graduate programme, that focuses surgical and obstetrical skills, and is concluded by an exam and a Fellowship title (cf. Annexe 13). Louffi et al. present an experience with a 6 months course in general surgery, obstetrics and gynaecology in district hospitals, under supervision. Follow-up showed that this training was life-saving at an acceptable level of mortality (cf. Annexe 25).

All training in clinical medicine should encompass first line clinical practice (5): medical doctors should observe, analyse and train themselves in first line clinical logic, to be able to integrate this part of the health system in their thinking, and to be able to teach and supervise nurse-practitioners and village health workers.

Finally, training in the district training hospital allows trainees to come in close contact with, and to participate in the district team, to appreciate role distribution and implementation, and advantages and limits of polyvalence.

Discussion

If this proposal, based on an analysis of the environment and the actual situation in clinical medicine and clinical training, and taking into account modern insights in didactics, is reasonable, which factors could hamper the implementation? Notwithstanding evident cultural and economic difficulties, we see resistance from the political, the medical, and the academic world.

Our proposal relies heavily on appropriateness of procedures and technologies. Politically, this can be a difficult point in that it is often understood as “medicine for the poor”, or worse, “medicine for the underdeveloped”. We should realise the political consequences of advocating simple technology, of challenging computer assisted learning, of promoting e.g. symphysiotomy. We should realise also that emphasising clinical epidemiology can be

understood as promoting a placebo instead of real tools, since few western universities include it in their basic training.

Primary health care can not function without well equipped and accessible hospitals: enough financial resources should be allocated to the medical services.

In some countries, it is still difficult to ask attention for better clinical training, as the confusion about the dichotomy between clinical work and public health persists. In many countries also, we see a strong resistance to delegation of tasks (e.g. surgery to district doctors, consulting to nurse-practitioners), and against decentralising of training towards districts.

The controversy between "advocates of knowledge" and "advocates of competence" is another hot debate. Often, the former refer to the majority of western universities, where knowledge-centred teaching is still the rule. Academics have difficulties with a complaint-centred approach: its scientific base is doubted, although often ill known. The utility of clinical epidemiology can also be challenged, since there is often a lack of a gold standard. Teaching, continuous training and self-training is regarded as an inborn art, not as a scientific discipline, by most medical academics. In many western universities, it is not included in the curriculum either, and if so, it is just another ex cathedra discipline.

Conclusion

Awaiting a revival of the economy in most tropical countries, and especially in tropical Africa, an effective way for improving clinical practice is to invest in training, at all levels, with an emphasis on continuous medical training. Replacing old paradigms as "education equals knowledge" and "at 25 you are a doctor for your entire life" will require a huge effort of all engaged in health, and will necessitate important changes in academic and political thinking.

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ANNEXE 24

Problem-based distance learning for postgraduate and continuing education

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Many developing countries wish to provide in-service postgraduate and continuing education for doctors serving in smaller hospitals or rural districts, so that they can continue with their duties without undue interruption. Because such countries have few specialists who can act as teachers, face to face teaching has to be replaced by distance education.

Successful learning at a distance from the teacher depends on a number of factors: it must satisfy the conditions of effective adult learning, it must encourage and support learning by isolated, very busy and frequently tired doctors, and it must be based on clearly defined objectives which relate to identified educational needs. Furthermore it must be supplemented by face to face educational opportunities to practice practical skills and it must be supported by facilities and resources that will enable these doctors to apply in practice what they have learned.

To meet all these conditions distance education must be based on a system for planning, implementing, and evaluating, a systematic needs assessment, a liaison with providers of clinical facilities and resources and educationally acceptable, effective and efficient distance education materials.

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ANNEXE 25

Training general practitioners in surgical and obstetrical emergencies in Ethiopia

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A 6 month course for training medical General Practitioners (GPs) in surgical emergencies was developed and pilot tested by the McGill Ethiopia Surgical Link in collaboration with the Ministry of Health of Ethiopia. The course was designed after an assessment of the surgical needs and manpower distribution in Ethiopia. This assessment showed that surgeons were virtually absent in rural areas of Ethiopia, but general practitioners and operating facilities were present.

GPs were selected by the Ministry of Health from rural hospitals that had no surgical specialists but had operating facilities. At the beginning of the course, the GPs identified their own lack of skills as the most important limiting factor in providing surgical emergency services. The course consisted of one week of lectures followed by 11 weeks each of practical experience in obstetrics/gynaecology and general surgery. The GPs trained in district hospitals under the supervision of fully qualified surgical specialists. Emphasis was placed on practical experience in managing a limited number of previously identified surgical emergencies.

Evaluations consisted in training assessment and written and oral examinations at the end of the course. These showed significant improvement in the GPs abilities. Follow up 9 months after completion of the course showed that 5 of the 7 GPs had performed significant numbers of life saving obstetrical and surgical procedures. Complications occurred largely in advanced disease and would have been difficult to avoid even by a fully trained surgical specialist.

Difficulties remain with recognition of the GPs' training and regular supervision and support. The cost for training was approximately \$ 2000 US per trainee (excluding expatriate salaries).

We conclude that GPs can be trained to provide life saving surgery in a short training program at a modest cost, but mechanisms for ensuring ongoing support need to be established.

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Kabisa, an interactive computer assisted training program for tropical diseases

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Kabisa is a computer based training program for tropical diseases. "KABISA" is the Kiswahili translation for "hand in the fire, I'm sure that....". A first DOS version emerged from a card game, also entitled KABISA. The actual Windows version covers near 200 diseases and 180 disease characteristics.

Instead of concentrating on strictly tropical diseases, we train students in recognising diseases in patients presenting randomly in a second-line hospital in a developing country.

The diagnostic logic is both cluster- and Bayes-based. Data bases are compiled by experts from experiences in various parts of each continent. Different geographical settings are available, seven languages and three levels of competence can be chosen by the student. In the highest level, disease characteristic presentation is ruled by sensitivities. In a "final exam" option all help functions can be blocked, and a cumulative score is calculated based on the number of correct diagnoses and an evaluation of the student's logic.

Actually we concentrate on refining inter symptom relations and multimedia linking.

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ANNEXE 27

Epitrop — A computer aided teaching programme of epidemiology and biostatistics

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Health professionals who work in third world countries have to rely increasingly on epidemiological and biostatistical skills to organise services and to deliver high quality care. There is an enormous need and an unmet demand for training in this field, even though a lot of short courses are being organised both in developed and developing countries.

Epitrop has been developed to make epidemiological training accessible to individual users overseas, when and where they need it. Its didactic approach is based on the integration of epidemiology and biostatistics, the use of problem solving methods and the provision of permanent feedback. Mathematics and calculations are reduced to a minimum.

Epitrop starts from a real life situation in a developing country. The student works through the whole process of data collection, analysis and interpretation and is confronted with the problem of decision making based on the available information.

The course has been repeatedly reviewed by user groups and formally appraised by WHO staff. A controlled pedagogical trial has shown that EPITROP has a learning potential that is equivalent to classical teaching.

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ANNEXE 28

**Management of severe and complicated malaria:
an "electronic book" program from project Manteau**

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Project Manteau is a new multidisciplinary education and training initiative under the aegis of the Control of Tropical Disease Division of the World Health Organization. Manteau aims to develop a comprehensive range of training materials and activities targeting the full spectrum of training needs. As part of this initiative, AVC Multimedia Ltd. have developed an interactive "electronic book" program based on the recently published WHO vade mecum on the management of severe and complicated malaria.

The program is written in "FortyTwo" and proprietary DOS-based authoring system developed by AVC Multimedia Ltd. It can best be understood as an "electronic book", divided into chapters, sections, and pages. The system provides a variety of maps, so that answers are always readily available to the key questions "Where am I?", "What have I seen?" and "How much is there still to

see?”. It also incorporates a search facility, which can display every page on which a target word or sentence occurs.

The program is designed to supplement, rather than duplicate, conventional training. It is expected that it will be of particular value in medical schools, where there are likely to be suitable computers. However, it also runs on a variety of portable microcomputers, and can therefore be used in the field.

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ANNEXE 29

The “five star doctor”: the doctor of the future ?

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Promoters of medical education need a clear vision of the expected outcome of their project, its acceptability in the national context and its anticipated impact on health care delivery. A project must be seen in the more general framework of improving the quality of medical education and medical practice.

Prerequisites for successful implementation of international support are that opportunities and constraints be understood in the context where a project will be initiated and that an appropriate strategy for change be identified.

Enhanced international collaboration is strongly justified, since there is a commonality not only of problems and challenges worldwide but also of the solutions envisaged.

From the very start, the project must be under the full direction of national authorities, and international collaboration must be planned and expected until the project is self-sustaining.