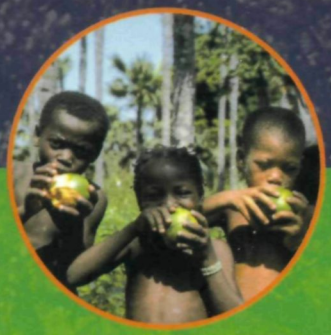
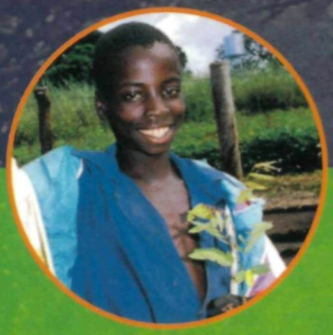
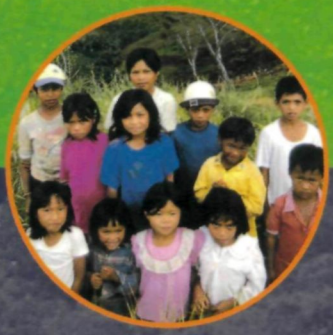
# Farmers of the Future

## *a strategy for action*







Farmers of the Future

# Farmers of the Future

*a strategy for action*

**Tom Vandenbosch**

**Peter Taylor**

**Jan Beniest**

**Azene Bekele-Tesemma**

Farmers of the Future - a strategy for action

Text: Tom Vandenbosch
Peter Taylor
Jan Beniest
Azene Bekele-Tesemma



World Agroforestry Centre (ICRAF)
Farmers of the Future
United Nations Avenue, Gigiri
PO Box 30677
Nairobi, 00100 GPO
Kenya
Telephone: +254 2 524000 or via USA +1 650 833 6645
Fax: +254 2 524001 or via USA +1 650 833 6646
Email: icraf(@cgiar.org
Internet: http://www.worldagroforestrycentre.org



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# Foreword

The World Agroforestry Centre (ICRAF) and Sida's Regional Land Management Unit (RELMA) conceptualized a 'Farmers of the Future' initiative in 2000 in order to facilitate and contribute to the integration of agroforestry and natural resource management in basic education. In so doing, we believe that we can help to enhance the quality and breadth of learning in basic education systems targeting the farmers of the future, while at the same time influencing the farmers of today. Providing children a wide array of knowledge and skills related to land, soil and water management, as well as a more positive attitude towards sustainable agriculture and rural life, will prepare them better for new challenges in the farming environment.

Organizations and institutions working in partnership with the World Agroforestry Centre on the 'Farmers of the Future' initiative met in May 2002 for round-table talks. The talks were jointly organized by the World Agroforestry Centre and RELMA to discuss ways in which different partners will complement and support the 'Farmers of the Future' initiative. Participants jointly generated a well-defined strategy for the improvement of natural resource management education and its incorporation in basic education systems.

Much of the information in this document is based on the outputs of the round-table discussions. A clear consensus has been defined involving ten cornerstones within a conceptual framework, which seek to enhance the relevance and impact of basic education programmes. These cornerstones have been identified as fundamental conditions, which need to be in place for the integration of natural resource management in basic education to be effective.

We think 'Farmers of the Future' has tremendous potential to contribute to the goals of the commitments made during the World Summits on 'Food for All' and 'Education for All', as well as to national poverty reduction strategies. We think within this framework there are some real crosscutting issues to which 'Farmers of the Future' can contribute.

We sincerely hope that this document will help in bringing the 'Farmers of the Future' initiative from the development of ideas into a working reality.

Glenn Denning, Director of Development, World Agroforestry Centre (ICRAF)
Ake Barklund, Director, Sida's Regional Land Management Unit (RELMA)

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Thanks go to the World Agroforestry Centre (ICRAF) for the photographs provided. We would also like to thank FALIASCOP for the permission to use photographs of the field day, which was organized at Uriri Boys High School (Migori, Kenya) in June 2002.

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Tom Vandenbosch, World Agroforestry Centre (ICRAF)

Peter Taylor, Education Consultant

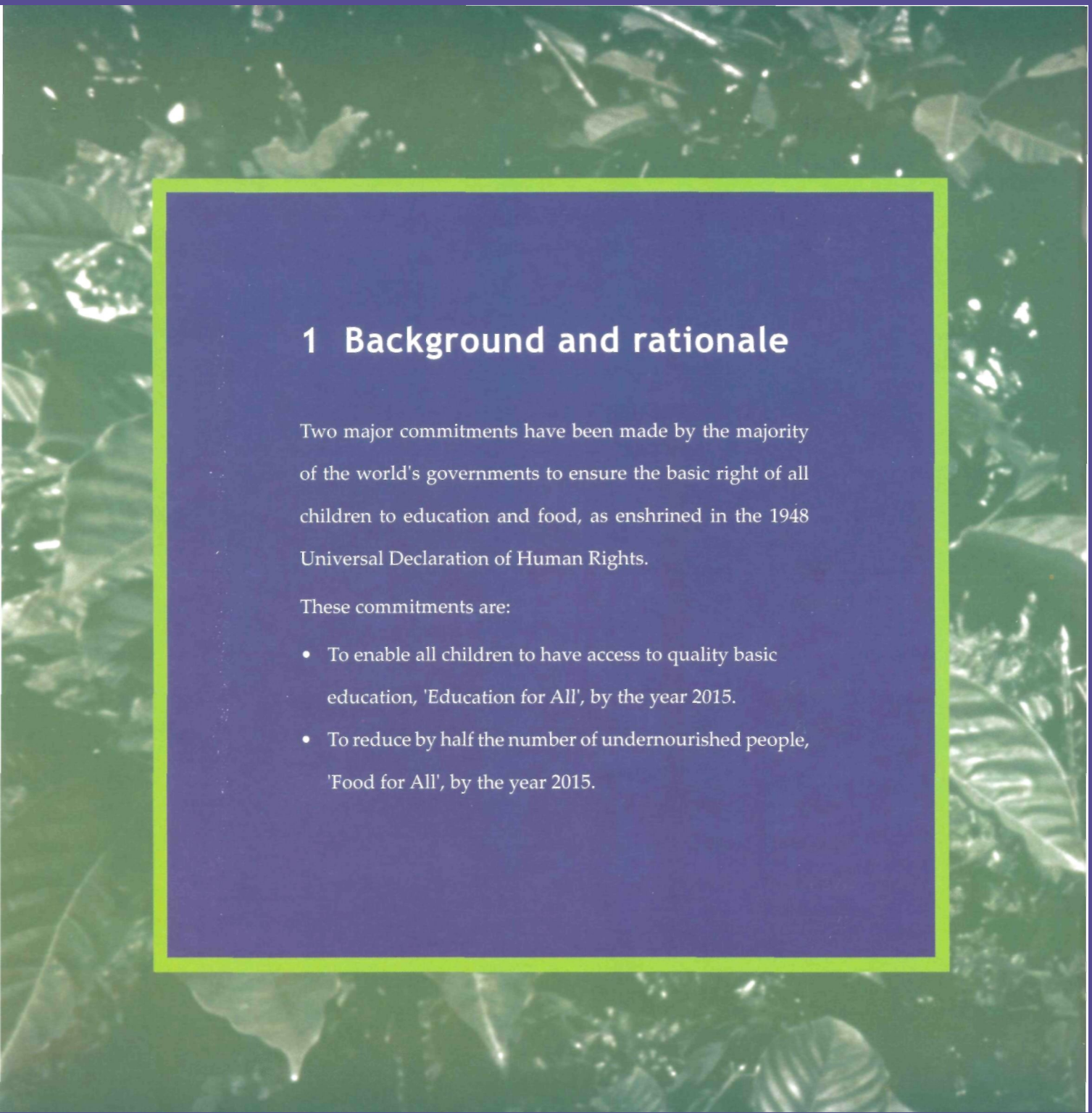
Jan Beniest, World Agroforestry Centre (ICRAF)

Azene Bekele-Tesemma, Sida's Regional Land Management Unit (RELMA)

# List of acronyms

| | |
|---|---|
| AIDS | Acquired Immune Deficiency Syndrome |
| ANAFE | African Network for Agroforestry Education |
| APEC | Asia-Pacific Economic Cooperation |
| ARIDSAK | Agroforestry for Integrated Development in the Semi-Arid Areas of Kenya |
| CBO | Community-Based Organization |
| CIPCRE | Cercle International pour la Promotion de la Creation |
| EFA | Education for All |
| EU | European Union |
| FALIASCOP | Forestry, Agriculture, Livestock Improvement and Soil Conservation Programme |
| FAO | Food and Agriculture Organization of the United Nations |
| FEE | Foundation for Environmental Education |
| FoF | Farmers of the Future |
| HIV | Human Immuno-Deficiency Virus |
| ICIPE | International Centre of Insect Physiology and Ecology |
| ICRAF | International Centre for Research in Agroforestry (now the World Agroforestry Centre) |
| IMF | International Monetary Fund |
| IPGRI | International Plant Genetic Resources Institute |
| ITAD | Information, Training and Development |
| IUCN | World Conservation Union |

| | |
|---|---|
| KOEE | Kenya Organization for Environmental Education |
| NGO | Non-Governmental Organization |
| NRM | Natural Resource Management |
| OAS | Organization of American States |
| PRA | Participatory Rural Appraisal |
| RELMA | Sida's Regional Land Management Unit |
| SADC | Southern African Development Community |
| Sida | Swedish International Development Agency |
| TIPE | Training and Information Programme on the Environment |
| UNAIDS | Joint United Nations Programme on HIV/AIDS |
| UNCED | United Nations Conference on Environment and Development |
| UNEP | United Nations Environment Programme |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNICEF | United Nations Children's Fund |
| USAID | United States Agency for International Development |
| VVOB | Flemish Association for Development Cooperation and Technical Assistance |
| WESSA | Wildlife and Environment Society of South Africa |
| WHO | World Health Organization |
| WSSD | World Summit for Sustainable Development |
| WWF | World Wildlife Fund |



# 1 Background and rationale

Two major commitments have been made by the majority of the world's governments to ensure the basic right of all children to education and food, as enshrined in the 1948 Universal Declaration of Human Rights.

These commitments are:

- To enable all children to have access to quality basic education, 'Education for All', by the year 2015.
- To reduce by half the number of undernourished people, 'Food for All', by the year 2015.

## The Reality

### But by the year 2000...

125 million children (1 in 6 of the world's children) do not attend school.

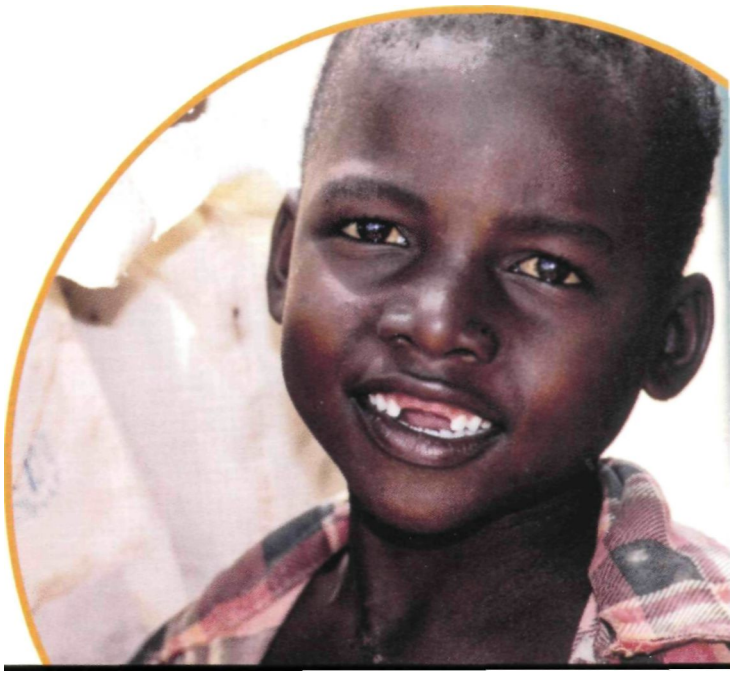
- 150 million children (1 in 4 of the world's children) of primary school age start school but drop out before they can read or write.
- 872 million people (1 in 4 adults) in the developing world are illiterate.
- More than 800 million people do not have access to enough food to meet their basic requirements.
- More than 1.3 billion people worldwide live in poverty; three-quarters of these live in rural areas.
- Every day on average 30 000 children die below the age of 5, due primarily to malnutrition and related illnesses.

### ... and following present trends, by the year 2015:

- 16 countries will fail to meet the goal of full enrolment of children in primary school.
- 88 countries will fail to meet the goal of the completion of 5 years of primary schooling by all children.
- The number of undernourished people is only decreasing at a rate of 8 million each year, instead of the 20 million each year needed to reduce the number of undernourished people in the world, by half.

This chapter describes the close relationships that exists between the commitments of 'Education for All' and 'Food for All' and suggests some clear strategies to tackle the interrelated issues of education, food and health together in an integrated and multidisciplinary way.





In 1990, government representatives signed the 'World Declaration of Education for All' in Jomtien, Thailand, stating that: 'every person - child, youth and adult - shall be able to benefit from educational opportunities designed to meet their basic learning needs'. This is to be achieved by:

- universalizing access to education
- focusing on learning acquisition
- strengthening partnerships
- strengthening of international solidarity.

In Jomtien the commitment was made to ensure the provision of basic education. Basic education is a broad concept. As articulated within the global framework of 'Education for All' (UNESCO 2000), it means 'education that fulfils the basic learning needs of all - children at first level of education, youth who are out of school and adults requiring lifelong basic education support - through a variety of delivery systems, formal primary schooling, non-formal/alternative schooling for those with limited or no access to formal schooling, literacy programmes and informal education'.

In 2000, the Dakar Framework for Action 'Education For All: Meeting our Collective Commitments' renewed the commitments made in Jomtien, and created a framework for action by the year 2015 by aiming to achieve six goals (UNESCO 2000):

- Expand and improve early childhood care and education.
- By 2015 all children, especially girls, have access to, and complete free and compulsory primary education of good quality.
- Ensure learning needs of all young people and adults are met through equitable access to appropriate learning and life skills programmes.
- Achieve 50% improvement in adult literacy by 2015, especially women, and equitable access to basic and continuing education for all adults.
- Eliminate gender disparities in primary and secondary education by 2005; achieve gender equality by 2015.
- Improve all aspects of the quality of education and ensure excellence of all so that recognized and measurable learning outcomes are achieved by all, especially literacy numeracy and essential life skills.

As stated in one of the twelve strategies of the framework: 'the quality of learning is and must be at the heart of 'Education for All'. All stakeholders - teachers and students, parents and community members, health workers and local government officials - should work together to develop environments conducive to learning. To offer education of good quality, educational institutions and programmes should be adequately and equitably resourced, with core requirements of safe, environmentally friendly and easily accessible facilities. Well motivated and professional competent teachers, books and other learning materials and technologies that are context specific and cost effective should be available to all learners.'

'Will our legacy be more than a series of broken promises?'

Nelson Mandela, speaking on the Millennium Development Goals, February 2001.

## 1.2 Food for All

The World Food Summit in Rome, 1996, provided a forum for debate on the need to eradicate hunger throughout the world. This took place as a result of increasing levels of undernutrition, the apparent incapacity of agriculture to meet future food needs, and the gradual degradation of the environment due to unsustainable natural resource management and land use (the latter being addressed through Agenda 21 of UNCED, Rio de Janeiro, 1992).

The summit ended with the adoption of the Rome Declaration on World Food Security and the World Food Summit Plan of Action, providing a framework for bringing about important changes in policies and programmes needed to achieve 'Food for All'. The Plan of Action explicitly and repeatedly refers to basic education as a critical element in the achievement of its aims (FAO 1996).

The World Food Summit: five years later' in Rome, 2002, renewed the global commitments made in 1996, recognizing the urgent need to reinforce the efforts of all concerned partners as an international alliance against hunger. The Summit also noted with concern the acute threat of the HIV/AIDS pandemic and its devastating impact on food security (FAO 2002).

## 1.3 Education, agriculture and HIV/AIDS

No other infectious disease of the modern era has had such a devastating impact on the world's youngest and most vulnerable citizens as HIV/AIDS. An estimated 42 million people are living with HIV today, including 3.2 million children under age 15, and more than 12 million young people between age 15 and 24 (UNAIDS and WHO 2002).

The Declaration of Commitment on HIV/AIDS of the United Nations General Assembly Special Session on HIV/AIDS in June 2001 established two goals specific to children affected by HIV/AIDS (USAID, UNICEF and UNAIDS 2002):

- Member countries will develop national policies and strategies that build and strengthen the ability of government, community, and family to support orphans and children infected with and affected by HIV/AIDS by 2003.
- Member countries will implement these policies and strategies by 2005.

HIV/AIDS affects the education system. It affects the demand for education as there are fewer children and youth to educate, fewer wanting to be educated or fewer who can afford to be educated. It also affects the supply of education and the quality of the educational process. It affects the management - with the risk that the whole system may become disorganized, paralyzed by fear and the lack of guidance on what is to be done. Responding to the challenge of designing and managing education in a world with AIDS requires mobilization of all sectors of society, flexibility, openness to change, willingness to loosen bureaucratic procedures and constraints, and sensitivity to the needs of those infected and affected by HIV/AIDS (Kelly 2000).

More than half of those newly infected with HIV today are between 15 and 24 years old. Each day, nearly 6,000 young people between the ages of 15 and 24 become infected with HIV. Yet the needs of the world's 1 billion young people are routinely disregarded when strategies on HIV/AIDS are drafted, policies made and budgets allocated (UNICEF, UNAIDS and WHO 2002).

One of the most telling and troubling consequences of the epidemic's growing reach is the number of children and youth it has either orphaned or seriously affected. Today more than 13 million children under age 15 have lost one or both parents to AIDS. By 2010, this number is expected to jump to more than 25 million. Often, food consumption of a child declines when a parent dies. In many areas today, there is a decline in agricultural and off-farm skills. In most rural areas, the usual way for children and youth to learn needed farm and off-farm skills is by working with their parents. Given the AIDS pandemic, this is often no longer possible. Education, training and the provision of survival skills are essential for orphans in order to protect them from hunger, exploitation and abuse. The only way to address this challenge is to form new alliances among the Ministries of Health, Education, Agriculture, the private sector, civil society and international organizations (USAID, UNICEF and UNAIDS 2002; UNICEF, UNAIDS and WHO 2002).

One of the five strategies endorsed by the UNAIDS Committee of Co-sponsoring Organizations in November 2001 to help families and communities cope with the crisis is to strengthen the capacity of children and young people to meet their own needs. Keeping children in school provides them with a secure environment to learn skills that will help them provide for their own needs as they grow into adulthood (USAID, UNICEF and UNAIDS 2002). Good quality education fosters analytical thinking and healthy habits. Better-educated young people are more likely to acquire the knowledge, confidence and social skills to protect themselves from the HIV virus. Life skills - skills in negotiation, conflict resolution, critical thinking, decision-making and communication - are vital for young people (UNICEF, UNAIDS and WHO 2002).

## 1.4 Challenges for education, food and health in rural areas

The commitments of 'Education for All' and 'Food for All' are already yielding good progress. The number of children attending school is increasing in many countries. The number of sufficiently nourished children and adults is rising globally. The challenges facing the achievement of 'Education for All' are enormous, especially in rural areas where low primary school participation, high dropout rates and under-education are still common. Rural poverty and educational deprivation create a vicious circle from which underprivileged households are often unable to escape.

The major challenges faced are outlined below.

1. Access to education in rural areas is lower among children, youth and adults, especially girls and women (illiteracy in rural areas is 2-3 times more than urban areas) due to:

- demographics
- inadequate necessary inputs
- lack of facilitating conditions (managerial, institutional, economic, social and political)
- health and nutrition problems
- gender factors
- poverty.

2. Quality and relevance of education in rural areas is often lower than in urban areas due to:

factors relating to the curriculum

- lack of agreement on education for who and for what
- problems of participation of the underprivileged and marginalized
- urban bias and irrelevance to local needs
- minimal focus on skills for life and sustainable development

factors relating to teaching and teacher capacity

- traditional pedagogies, underqualification and demotivation of teachers
- lack of support to teachers and schools in rural areas
- institutional constraints
- need for capacity building of teachers, teacher trainers and education advisors
- the HIV/AIDS epidemic negatively affects the number of teachers, especially in rural areas with relatively small schools, where the death of a teacher may result in the disruption of schooling, if the teacher cannot be replaced rapidly (Haacker 2002).



## 1.5 Education makes a difference

'Education is the world's single most powerful weapon against poverty. It saves lives. It gives people a chance to improve their lives.'

Oxfam, 1999.

Fortunately there is considerable hope, even though the challenges are great. Research has provided strong evidence (Carnoy 1992; Appleton and Balihuta 1996) that basic education makes a direct contribution to the reduction of poverty in rural areas. A minimum of 4 years of basic education, which addresses literacy and numeracy as well as science and possibly agricultural education, can lead to an increase in agricultural productivity by up to 8%. Coupled with this relationship is the important factor that families who raise themselves out of poverty and achieve a sustainable livelihood are in a better position to support their children to attend school, thus adding momentum to the process of change and development. Another study (McMahon 1999) shows that secondary education lowers rural poverty and reduces deforestation. In the words of the final communique adopted at the World Education Forum in Dakar: 'Without accelerated progress toward 'Education for All', national and internationally agreed targets for poverty reduction will be missed' (UNESCO 2000).

Although the close relationships between poverty, lack of food, health and absence of education have long been recognized and understood, development strategies at international and national levels have tended to treat equitable access to quality education and food as separate issues.

There is a lack of information and experience-sharing about the realities of basic education and schooling in rural locations in specific countries. The endemic problems of education access and quality in rural areas need to be recognized, understood and addressed through coherent, explicit policies and strategies. Support and capacity building is needed for institutions engaged in basic education in rural areas, for human resource development, and for collaborative learning and action between different stakeholders. It is no longer acceptable for these conditions to be maintained; action is now vital. Practical means are required to ensure that the rhetoric of these global frameworks become a reality.

'I see no other way of helping rural children to attain higher levels of learning than making whatever is taught to them meaningful to their needs and interests by relating it to their real life situations.'

Seshadri, 1997

The flagship provides an enabling environment for integration of innovation and action. One example is the 'Farmers of the Future' initiative, which builds on lessons learned from successful strategies emerging from research and experiences of educational interventions in rural areas. These strategies include:

- development of innovative, contextualized curricula and learning materials
- introduction of active, experiential methods of teaching and learning
- support of sustainable agriculture and rural development
- production of healthy and nutritious food through sustainable land use and environmentally sound practices
- involvement of school members in the community and community members in schooling.

In summary, initiatives which support basic education in rural areas, should aim to address the following issues:

- provide and maintain quality teacher training and support
- ensure resource availability and access
- institutionalize innovative methods and approaches
- influence and support policy formation and implementation
- build and maintain effective partnerships and cooperation.

The 'Farmers of the Future' initiative, described on the following pages, provides an opportunity and a platform to address these issues in a practical and meaningful way.

# 2 From an idea to an action plan

Based on the need to tackle the interrelated issues of education, food and health in an integrated manner as described in the previous chapter, the World Agroforestry Centre (ICRAF) and its partners have recognized the opportunity for strengthening basic education through agroforestry and natural resource management. This important innovation in capacity building was adopted in the Centre's corporate strategy 2001-2010. The 'Farmers of the Future' initiative was born. What once started as just an idea, has now developed into a coherent and integrated approach for enhancing basic education through the integration of natural resource management. The process of shaping the initiative through the involvement of various stakeholders and partners is described in this chapter.

The vision of the World Agroforestry Centre (ICRAF) is that by 2010, through agroforestry, 80 million people living in poverty will have more options for improved livelihoods, and the global environment will be more sustainable. By 2020, it is expected that more than double this number will be offered such options.

To convert this vision into reality, the World Agroforestry Centre conducts innovative research and development on agroforestry, strengthens the capacity of its developing-country partners, enhances worldwide recognition of the human and environmental benefits of agroforestry, and provides scientific leadership in the field of integrated natural resource management. The Centre's mission is to lead global efforts in agroforestry research and development aimed at achieving our vision of a better future. This will be done by combining the best of science with the knowledge of farmers in a wide range of strategic alliances across the research-to-development continuum.

The official mission statement is: 'to contribute to food security and poverty eradication through research promoting sustainable agricultural development based on the environmentally sound management of natural resources. This mission will be achieved through research leadership, partnership, capacity building and policy dialogue.'

Capacity building and development activities carried out by the Centre's Training and Education Programme in collaboration with its partners, comprise in-service training through short courses and supporting training materials. Their activities also promote the provision of individual training opportunities, both degree and non-degree, and strengthening formal education in agroforestry and integrated natural resource management.



Even though the Centre has been active in agro-forestry and natural resource management education at the tertiary level (universities and technical colleges) for many years, the recognition of the need to also strengthen basic education levels is a more recent development. It stems from the realization that most future farmers in developing countries of the tropics are those who may have had only very limited formal education opportunities or dropped out of school for various socio-economic reasons.

Training and education activities aimed at higher educational levels will ensure that countries have institutions and individuals that are capable of integrating agroforestry and natural resource management in sustainable agricultural production systems. However, it is equally important that those whose livelihoods depend on this - the farming households in developing countries - are knowledgeable and prepared to consider such options in their farming systems. This can only be achieved if they are introduced to this at an early age, through formal primary and secondary education.

In response to this need, the World Agroforestry Centre has now included a 'Farmers of the Future' initiative in its capacity building and development activities. This initiative started in 2000 with the development of a concept that reflected an internal strategy to address the issue of agroforestry and basic education. One of the outcomes of this internal discussion was an identified need for a full-time staff member to take this initiative further in terms of research, partnership development and resource mobilization. In 2001, the Belgian Government, through its VVOB programme, seconded a staff member to work with the World Agroforestry Centre's capacity development team on this initiative.

The next phase of the initiative led to a clearer formulation of the strategy based on consultations and a desk study that looked at worldwide research and development results, experiences, opportunities and constraints on the subject of agriculture and natural resource management in basic education.

Based on the outcomes of this phase, the Centre decided to present the initiative to possible partners active in education, agriculture and the environment for further discussion and implementation. This was achieved through a round-table discussion, co-organized by RELMA and funded by several donors, in May 2002.

The objectives of this round-table discussion were to design a strategy for the initiative, including principles for implementation, to build an open community of practitioners and to identify possible areas for future projects and activities. This was achieved through a five-step process - sharing of experiences and lessons learned, analysis of approaches, building a conceptual framework for the initiative, operationalizing such a framework and identifying the next steps for implementation.



The four-day meeting brought together a total of 57 national and international education and natural resource management specialists. It started with a series of presentations, both in a plenary session and through posters, on various experiences on the subject of agriculture, natural resources and education. An analysis of these experiences and lessons learned, allowed the participants to identify potentials, constraints, opportunities and success factors in the integration of agroforestry and natural resource management into basic education. This in turn led to the identification of a series of 'cornerstones' or 'fundamentals' of any strategy aimed at achieving this if such strategy is to be successful. This is described in more detail in chapter 4.

Participants also discussed the practical implications of the planning and implementation of this initiative in the immediate and longer term future. This also included the identification of the human and financial resources that will allow the 'Farmers of the Future' initiative to enhance the quality and relevance of basic education through the integration of agroforestry and natural resource management.

One of the major achievements of the round table was a consensus reached on the distinctive feature of 'Farmers of the Future'. The outcomes are now envisioned as:

- improving the agricultural and natural resource management knowledge, skills and attitudes of children and youth
- empowering young people by enhancing the effectiveness of formal and non-formal education through active, experiential and contextualized learning
- promoting the integration of sustainable natural resource management into basic education, contributing to the improvement of rural livelihoods, land use management and environmental conservation
- linking with and making good use of existing national and global policies and agreements
- bringing direct benefits to all learners and their families and strengthening linkages between schools, homes and communities, particularly in rural areas
- encouraging local and regional collaboration and networking through flexible participatory multi-stakeholder approaches.

The outcomes of this round-table discussion also served as a basis to the development of the present paper which will be the strategic document for the collaborative implementation of the 'Farmers of the Future' initiative.

# 3 Building on experiences

There are many recent initiatives around the world aiming to improve the effectiveness of basic education with a focus on agriculture, forestry, land and water management, sustainable development and/or environmental protection, but these efforts are fragmented and not widely known. Innovative approaches have been tried with varying degrees of success and novel ways of working are still emerging. Several experiences from around the world illustrate that successful projects in agricultural education and education for sustainable development have the potential of impacting rural livelihoods. Lessons learnt from those experiences show some of the important prerequisites and challenges for the successful introduction of agroforestry and natural resource management in basic education systems. This chapter highlights common threads, examples of strategies that work, and guidelines for developing new projects. The 'Farmers of the Future' initiative is emerging as a result from these many experiences and is providing a cohesive long-term strategy to address inter-related issues of basic education, natural resource management and sustainable development.

On the following pages, key lessons from experiences in agricultural education and education for sustainable development are summarized. In fact, there are no clear boundaries anymore between agricultural education and education for sustainable development, because aspects of natural resource management have been integrated into agricultural education and almost all education for sustainable development programmes now contain important elements of sustainable agriculture.

The conceptual framework for 'Farmers of the Future' that has emerged from these lessons and success factors is described in the next chapter.

## 3.1 Agricultural education: from labour to learning

There have been a number of very detailed and thorough reviews of the debate on teaching agriculture in schools. Riedmiller (1994) notes that the development of teaching agriculture in primary schools has been closely linked to political and ideological viewpoints. Marxist philosophy and its derivatives saw primary school agriculture as a means of initiating the population into the work ethic under the banner of 'Education with Production', whilst others saw agriculture as a 'relevant' subject area, pertinent to the development of the individual and ultimately the nation. Colonial education systems also included primary school agriculture, frequently adapted to local conditions, since it was seen as a means of educating the 'native' population for productive work. Needless to say, post-independence governments were keen to shed primary school agriculture as a relic of the colonial past.

In recent times, increased unemployment, both urban and rural, encouraged some governments to reintroduce primary school agriculture as a means of 'training for exit'. Considerable investment was made into developing agriculture as part of the primary school curriculum. Disappointment has been created by the apparent failure of pilot schemes to take off successfully on a large scale, and the reluctance of some key donors to continue support to vocationalization of primary education.

Today, there is conflicting evidence about the popularity of primary school agriculture. In some instances it is said to be very popular amongst school students. Reasons given for this are that it is an 'easy' subject and it provides an excuse to get out of the classroom. When it is well taught, it is experienced as a stimulating subject, rich in educational experiences and activities, with plenty of scope for project work. The 'production' aspect of primary school agriculture is also cited as a plus factor, since pupils may provide a source of income and food for themselves, their teachers and even the local community.

In other cases, however, primary school agriculture is perceived to be deeply unpopular, being seen as 'dirty', or as a form of punishment, and as a means by which pupils' labour is exploited. Some pupils and parents feel that it is unlikely to lead to paid employment, and link it with the poverty of subsistence and rural life which many young people seek to escape. Equally, as urban populations rise at the expense of rural-based populations, many urban-based young people do not see the relevance of an agricultural education.

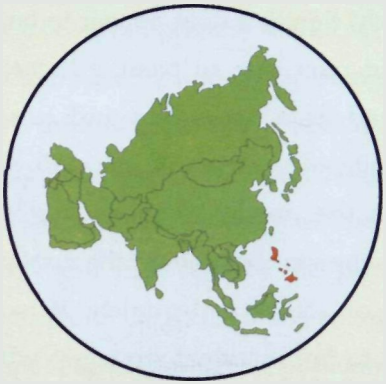
Primary school agriculture is thought, generally, to be an interesting and relevant area of study, but it is not seen as a priority area due to the many constraints which obstruct the effective delivery of agricultural training in primary schools. Combined with the fact that there is still doubt over the contribution of teaching agriculture in schools and its impact on national agricultural productivity, these factors seem to have resulted in agriculture being seen as a 'Cinderella' subject, neglected by most of the mainstream proponents of basic education programmes (Taylor and Mulhall 1997; Taylor and Mulhall 2001).

Fortunately, thinking does appear to be changing. This is in part due to basic education being recognized as a necessary and fundamental prerequisite of sustainable rural development, based on the need to ensure that education addresses the specific needs of the rural population in terms of access and quality. It is still rare, however, to find national strategies which really combine and integrate rural development and basic education. This is often due to a division of responsibility at national level, with one ministry having responsibility for Education, especially the formal education sector, and perhaps several other ministries (Rural Development, Agriculture, Forestry, Water, Health, etc.) addressing their own remits. Many donors have to work through a particular ministry, and hence donor support tends to be fractionated as well. This is a common and rather depressing picture in terms of the impact of interventions, with efforts dissipated and a lack of co-ordination on the ground where grassroots movements need support. It also reflects a lack of a strong conceptual framework within which support to rural development and basic education can be located.

There is a need for a new paradigm for basic education in rural areas, especially primary schooling, which is underpinned by a sound theory and practice in sustainable agriculture and rural development. This goes far beyond simply 'teaching agriculture'. Encouragingly, there are growing numbers of examples around the world of exciting, innovative ways in which agriculture is being integrated within wider teaching programmes in basic education, and explicitly linked to sustainable rural development. Many of these initiatives are concentrated at a local level, rather than major national programmes, although there are a few countries such as Uganda and Sri Lanka which are actually paying additional effort to the rejuvenation of agricultural teaching as part of a wider overhaul of their primary schools curriculum. This suggests that there may be a potential for agriculture to play a role in primary schooling which perhaps has not yet been fully tapped. Some examples of recent and ongoing interventions which involve agriculture in schools in rural areas are described in the boxes below. These have been selected on the basis that they are using agriculture in ways which are innovative, learner-oriented, and strongly linked to the realities of pupils, parents and communities.

# Case study:

## Landcare in Schools in the Philippines



Landcare is an initiative which has been developed extensively in Australia and has spread more widely in the South East Asia Pacific region. In the Philippines, Landcare has been adapted for use with schools in Claveria (Mercardo et al. 2000) and in Lantapan (Catacutan and Colonia 2000). In order to create an holistic approach to Landcare which involves the whole community, schools have also become involved. It creates *an* opportunity for schools to enhance their Environmental Education programme, and also integrates well with other subjects such as Technology and Home Economics, and science subject matters like Biology and Ecology. Landcare concepts have become embedded in the school curriculum. Landcare also aims to prepare young people for their future role as stewards of the land. The Landcare in Schools programme has started with an information and education campaign (including training of teachers in technical issues and facilitation skills), and progressed through formation of groups and clubs, establishment of school nurseries, and demonstration of conservation farming and agroforestry technologies. Already there is active involvement from Parents and Teachers Associations and Local Government Units. Parents are adopting soil and water conservation and agroforestry technologies as the result of encouragement from their children. The key principle of Landcare in Schools is that pupils, students and teachers can learn, work and enjoy together.

## Case study:

# School-based nutrition project in Western Kenya

An action research project on traditional vegetables recruited primary school pupils as co-researchers with community members. The project explored the feasibility of increasing the intake of traditional vegetables through a school-based horticulture programme, and aimed to increase pupils' competence as effective change agents by empowering them in culturally compatible ways. Following the success of the project, new schools have become involved, with training of more teachers in the methodology. The relationship between teachers and pupils has shifted, as pupils now feel confident to discuss ideas openly and participate more actively in learning. The action-oriented modes of learning took the pupils away from the monotonous learning of the classroom and gave them motivation and satisfaction since they were actively involved in community development. Pupils became livelier to teach, more active and outspoken, and their participation in class was much enhanced. Some pupils were looked on as knowledge holders and became instructors to pupils from other (and even higher) classes and guest from other schools. Usage of a diverse range of traditional, nutritious vegetables has increased in the community. Community members have expressed their satisfaction that for the first time in their lives they realized that education should not be divorced from community participation, and that children have a significant role to play (Ogoye-Ndegwa et al. 2002).

Case study:

# Improvement of School and Family Nutrition through Integrated Agroforestry Systems in Panama

This programme aims to improve production and consumption of nutritious foods, and to work within the schools to integrate agroforestry systems (fruit trees, quick growing plants for animal feeding, domestic animals, environment components, gardens). School-centred demonstrative technical units were implemented in 13 pilot villages. Children from age 6-14 were targeted. One-day workshops were given to students, teachers and parents. Only local resources were used, and no 'high-tech' equipment was involved. Many positive things have resulted from this project. Demonstration Units will serve as open schools. New fruits and grains were introduced into the gardens. New techniques of rice production and composting animal and vegetable waste were used by the farmers. Workshops were given on horticulture, nutrition, food preparation, preservation and different uses of foods. Training components included food security, rural development and agroforestry. The project lasted two years and was originally meant for maintaining school gardens, but the production was so huge that, besides being used for school feeding and being distributed to the parents, produce was sold on the market. Funds were established by this income. The multisectorial approach of the project avoided duplication of human, economic and logistic resources, and was based upon an integrated approach to resolve various human needs. The participatory rural appraisal allowed the population to express their needs, their problems, and to find solutions for themselves, by themselves (FAO 2001).

These cases demonstrate that agriculture is being given a new role in schools in rural areas. It is being used increasingly as an integrating and relevant area of learning which is meaningful to children and youth since it is a fundamental part of their lives at home, as members of their communities, and now as an element of the learning process at school. The benefits are being seen by not only the children and young people themselves, but also by parents, teachers, school administrators and community members in general. What is rather exciting about these examples, in comparison with more conventional 'school agriculture' programmes, is that the learning process is considered explicitly. Instead of the aim being simply that children will learn about agriculture (an aim which all too often has not been fulfilled), a conscious shift is emerging towards using agriculture as a medium for helping children and youth to learn more effectively.

## 3.2 Education for sustainability: from Rio to Johannesburg

Education for sustainable development is an emerging but dynamic concept that encompasses a new vision of education that seeks to empower people of all ages to assume responsibility for creating a sustainable future. Since 1992, an international consensus has emerged that achieving sustainable development is essentially a process of learning. Basic education provides the foundation for all future education and learning and is a contribution to sustainable development in its own right (UNESCO 2002).

Many national, regional and international initiatives have contributed to an expanded and refined understanding of the meaning of education for sustainable development. For example, Education International, the major umbrella group of teachers' unions and associations in the world, has issued a declaration and action plan to promote sustainable development through education (Education International 1998). Similarly, statements and guidelines in support of reorienting education

towards sustainable development have been issued by regional councils of Ministers of Education and/or Environment in APEC, EU, OAS, SADC and the South Pacific. Many regional strategic or action plans have been developed. A common call in all of these is the need for an integrated approach through which all government ministries (Education, Agriculture, Health, Environment, Finance, Industry and Consumer Affairs, etc.) collaborate in developing a shared understanding of and commitment to policies, strategies and programmes of education for sustainable development.

International conservation organizations such as WWF and IUCN are also actively promoting the integration of education into sustainable development at local community, national and eco-regional scales. In addition, many individual governments have established committees, panels, advisory councils and curriculum development projects to discuss education for sustainable development, develop policy and appropriate support structures, programmes and resources, and fund local initiatives.

These initiatives illustrate that the international community now strongly believes that we need to foster - through education - the values, behaviour and lifestyles required for a sustainable future. Education for sustainable development has come to be seen as a process of learning how to make decisions that consider the long-term future of the economy, ecology and social well-being of all communities. Building the capacity for such future-oriented thinking is a key task of education (UNESCO 2002).

In reaching decisions about which approaches to education will be locally relevant and culturally appropriate, countries, educational institutions and their communities may take heed of the following key lessons learned from discussions and debates about education and sustainable development over the past decade (UNESCO 2002):

- Education for sustainable development must explore the economic, political and social implications of sustainability. Educational approaches must take into account the experiences and particular circumstances of various cultures and minorities, acknowledging and facilitating their original and important contributions to the process of sustainable development.

- Ethical values are shaped through education, in the broadest sense of the term. Education is also essential in enabling people to use their ethical values to make informed and ethical choices. Fundamental social changes, such as those required to move towards sustainability, come about either because people sense an ethical imperative to change or because leaders have the political will to lead in that direction and sense that the people will follow them.
- The effectiveness of education for sustainable development must ultimately be measured by the degree to which it changes the attitudes and behaviours of people, both in their individual roles and in carrying out their collective responsibilities and duties.

Analysis of lessons learned over the past decade of educational innovation illustrates that educational systems and institutions are beginning to understand the importance of education for sustainable development, the new vision of education it encompasses, and the contributions it can make to both education and sustainable development. However there are still issues and challenges remaining. While progress has been significant, it has been uneven. No one country has integrated education into all aspects of its sustainable development plan. No one country has been able to implement all dimensions of the process of reorienting education towards sustainable development.

Among the significant issues and challenges are the following (UNESCO 2002):

- Better integrating education for sustainable development into sustainable development policies, e.g. economic, environment and population policies.
- Better integrating education for sustainable development as a framework for education policies, especially national action plans related to EFA goals.

- Addressing issues of governance to improve coordination between Ministries of Education and Ministries of Environment, Natural Resources, Agriculture, etc.
- Emphasizing education for sustainable development in both formal and non-formal education.
- Strengthening institutional capacity building and professional development processes for improved planning and implementation of education for sustainable development.
- Increasing monitoring, evaluation and reporting of sustainable development education initiatives and their outcomes and impacts.
- Increasing attention to the sustainability of initiatives so that policies, programmes and activities are embedded in long-term education plans and financial arrangements.

Some effective ways of moving forward are (Pande, 2002; UNESCO 2002):

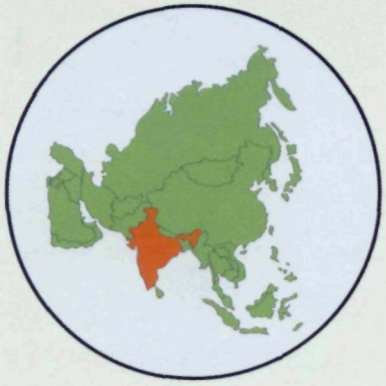
- Improving the orientation, relevance and quality of existing education programmes, linking classroom theory with actual environmental problems, identifying links between issues reflecting the real world situation and relating education to the local community in a broader social and ecological context.

Capacity building: Teachers are the key to learning and the quality of education. Increased efforts to reorient teacher education courses and programmes towards sustainability can empower teachers to maximize student and community participation in negotiating what and how students learn and for what purposes.

Reorienting education for sustainability: This requires political will from governments willing to model an inter-departmental, cooperative approach to sustainable development. Schools, other educational institutions and the community at large could then take up that lead with school-wide, community-inclusive approaches that aim to engage each individual, adult and child, in the process of seeking sustainable lifestyles.

## Case study:

## Our Land, Our Life in India



The Uttarakhand Environment Education Centre, a voluntary organization, has with the support of the State and National Governments introduced a separate course in the hill areas of the Central Himalayas. A teaching manual and a set of workbooks entitled 'Our Land, Our Life' were developed for Classes 6-10 (age group 11-16 years). The purpose of the course is to place both environment and livelihood issues in the mainstream of the curriculum. The course is a unique example of a holistic, practical, locale specific course. Land degradation has been identified as the major environmental problem of the region. The course is practical in nature and students are taught the knowledge and skills required to manage their village ecosystem in a sustainable way. In designing the course, the Centre has taken a cue from the grassroots work of various local organizations, especially women's groups. The course is now examinable in Classes 6-8.

The village is the laboratory for students to learn and experiment. Using basic measurement concepts, students learn to quantify their village resources and calculate how many people and animals could be supported, how much is produced under existing management practices and how much could be produced under improved systems. The theoretical understanding of concepts relating to soil, water flows, compost, population dynamics, ecological concepts, land rehabilitation, types of trees, and so on, is followed by practical exercises in the study village. Towards the end of each exercise, all information is assembled to assess the situation. The whole course is built on the concepts of sustainabih'ty and the carrying capacity of the village ecosystem.

The course is currently running in 356 schools involving some 50,000 students. More than 700 in-service teachers have been trained so far. Along with the course in schools, the project envisages capacity building among local village-based NGOs and community organizers (Pande 2002).

# 4 Ten fundamentals of Farmers of the Future

The experiences described on the previous pages provide deep insights and lessons learned from different countries, contexts, and situations around the world. During the Nairobi round table on 'Farmers of the Future' in May 2002, the lessons learned and success factors of different case studies were discussed, clarified and then clustered into ten fundamental elements. These were put together into a conceptual framework for 'enhancing basic education through the integration of natural resource management', based on a methodology developed by Hagmann (forthcoming 2003).

When analyzed together the ten fundamental elements formed a conceptual framework which provides central elements of successful interventions. Each fundamental element interacts and inter-relates systemically with the other elements. Failure to address one will weaken the whole framework and jeopardize success. It is not essential that each of the elements be addressed equally or actively; it will depend on the context and/or the specific situation. In some cases additional focus on two or more of the fundamental elements may be required. Never the less, the framework itself serves as a checklist that can also be used for self-reflection, evaluation and design of 'Farmers of the Future' interventions.

The framework is also a learning frame. In each of the fundamental elements, any gaps in existing knowledge and experience can first be defined and then specifically explored in the different contexts. The lessons learned and experiences gained can then be integrated into the conceptual framework. All parties involved in this systematic joint learning process can benefit from the synergy generated, which might not be the case if working alone. This core approach of working through collaborative learning partnerships lies behind the fundamentals of the 'Farmers of the Future' initiative.

One of the main aims of 'Farmers of the Future' is to develop experiences with each of the fundamental elements in a wide variety of situations and diverse contexts in order to extend a range of strategies and approaches to benefit the farmers of the future.

On the following pages, each of these ten fundamentals or cornerstones is described in more detail. An explanation is given on the content of the cornerstone, a relevant case study is analyzed, and some possible areas for action are suggested.


Enhancing basic education through the integration of natural resource management
Facilitation and management of the initiative
Enabling policy environment
Experiential learning-based curriculum
Training, teaching and leadership competence
Teaching and learning resources
Pilot sites as learning cases
Tangible benefits
Multi-stakeholder participation
Public awareness, advocacy and resource mobilization
Strategy and facilitation for institutionalization

## 4.1 Enabling policy environment

The policy arena within which the 'Farmers of the Future' programme is situated is complex. It spans policy related to education, labour, agriculture, forestry, water, environment, health and social affairs. In many countries, these are viewed as sectors, lacking integration of the overall policy process, and fragmentation of policy implementation through the activities of organizations and institutions which are poorly linked. A new global policy environment is emerging, bringing 'Education for All' within a wider framework of sustainable development and natural resource management. For this to be successful, new and effective policy environments need to emerge both at national levels, and local levels through policies such as decentralization, by giving more power and responsibility to local education authorities, institutions and communities.

The policy environment is enabled through a high degree of dialogue, collaboration and partnership in the policy development process. Efficient allocation and management of resources allow policies to be put into operation, and effective monitoring and evaluation of policy implementation are necessary, feeding back into a transparent policy review process. Good policies for education and schooling can give clear guidance but refrain from placing the control over operations in the hands of small groups who can wield power inequitably. Constant change is avoided, and the policy process is supported by strong knowledge management systems, which increase the flow of information required and provided by stakeholders involved at different levels of the education system. Good governance is an essential element of the overall policy environment.

## Possible areas for action

- Identification and dissemination of existing national and global policies with relevance to 'Farmers of the Future' activities.
- Establishment and promotion of fora and mechanisms for improved, participatory policy dialogue.
- Support of improvement and integration of knowledge and information management systems in relation to education, natural resource management, health and environment.
- Sensitization of policy makers to issues relevant to 'Farmers of the Future', and capacity building for those engaged in policy implementation and operations at national and local levels.

## Case study:

## Education reform in Cuba

Cuba provides an interesting example of how wide-reaching policy reforms and an enabling policy environment can bring about beneficial changes in basic education. Cuba has an exemplary record in provision and delivery of basic education, particularly for schooling in rural areas. This success may be attributable to a range of factors, including teacher and student initiative in adapting the national curriculum and developing instruction materials locally, great attention paid to teachers and their development, mechanisms to foster community participation in school management, and linking schooling with the world of work. Conscious efforts are made to involve communities and parents in the life and work of the school, quite often assigning them key decision-making roles and responsibilities.

Cuban schools give children responsibility for a variety of tasks appropriate to their ages. Children help fellow students with difficulties, discuss class and school problems, and work in the school garden. School garden activities nowadays tend to have more of a pedagogical than a productive goal (Gasperini 2000).

## 4.2 Experiential learning-based curriculum

Natural resource management education is complex, and based upon a very wide, diverse range of knowledge, which originates from different sources. Learners can use information to help them gain access to sources of new knowledge. Learning takes place most powerfully, however, when individuals or groups of learners undergo experiences which allow them, through a process of reflection and action, to reconstruct their own knowledge. There are powerful arguments from the biology of learning and from psychology which support this approach. We retain 80 percent of what we do as opposed to 10-20 percent of what we hear and read. Therefore, the process of education must emphasize active, experiential learning and real-world problem solving. Still, experiences by themselves do not necessarily teach learners. It is the role of the educator, by structuring the experience, to help the learner gain knowledge from impressions, experiments, discussions, exploration, examination, game-playing, discovery and hands-on activities. A strength of natural resource management education is that it offers great potential for learning through reflection and action; related activities can both draw the learner into the learning exchange and also become the basis for the learning that is to follow.

The view of farming and the natural environment as 'soft systems' further emphasizes the need for experiential learning approaches. Soft systems are not fixed, or based on objective 'truths', but are based on a systemic view of knowledge which is constantly shifting and growing, and which needs to be understood and valued. When one tries to separate the elements of a system in order to study each element in isolation, something important is lost, even if an attempt is made later to reintegrate the parts. Therefore, the 'wholeness' of a system (e.g. the agricultural environment as a whole) should be studied. Without looking at the whole, the parts cannot be fully understood. Experiential learning is well suited to soft systems approaches because it is geared towards problem solving in an integrated way. Many people engaged in the natural sciences are used to the reductionist model of 'classical' research whereby factors are separated for better study, and knowledge is seen as an objective entity, 'out there', ready to be transmitted.

As a result, many education programmes are based on disciplines and are content-based, failing to build upon the richness and relatedness of the real world or the experience and existing knowledge of the learner. Experiential learning approaches will be an important prerequisite for successful 'Farmers of the Future' projects, since learning will become more effective as a result. It is defined therefore as a separate cornerstone within the conceptual framework.

## Possible areas for action

- Situation analysis, curriculum review and needs assessment.
- Organization of participatory curriculum development workshops and participatory resource material development workshops.
- Development of curricular resources that strengthen learning processes by providing information, activities, and firsthand experiences based on learning situations and challenges relevant to the learner.
- Development of leader/teacher training modules in experiential learning.



## Case study:

## New school curriculum in Zambia

Previously, the school curriculum for lower and middle basic levels consisted of a large number of separate subjects and was overloaded. The curriculum has now changed. It has been realized that children do not view their life and experience in neatly compartmentalized segments but take a holistic view with no boundaries imposed by the idea of segregated curriculum subjects.

Schools are encouraged to add a localized component in addition to the centrally defined core curriculum. They are also encouraged to deliver the core curriculum, when relevant, using local examples, materials and methods. Schools must coexist in relation to the local community. One of the many ways interaction can take place, is for the teacher to show respect and interest in local skills and find ways of integrating them into the localized curriculum. The teacher must have a deep awareness and interest in the characteristics of the local community in which he or she works.

Some ways in which the relationship between schools and local communities can be strengthened are now explained in the teachers' curriculum manual, like the identification of traditional skills and competencies among parents and the local community (growing various crops, local herbs and medicine, tending cattle, etc.) or the organization of a project on an area of interest i.e. water, food, nutrition, etc. (Curriculum Development Centre 2001).

## 4.3 Training, teaching and leadership competence

The key to successful educational innovation lies largely with the teacher, as the interpreter and deliverer of the curriculum, in partnership with the learners. The capacity of the teacher to interpret the curriculum and relate it to the local context will depend on a number of factors, including personal motivation, competence in a range of teaching and learning strategies and professional attitude, especially towards learners. For 'Farmers of the Future', knowledge, skills and attitudes in the domain of agroforestry and natural resource management are also vital. Unfortunately, teachers are often inadequately prepared and supported in their work. Curricula, textbooks, and teacher training are often based on assumptions and objectives that do not reflect local realities, or the learning needs of most students. Many teachers receive some pre-service training prior to taking up a teaching position, but the quality often leaves a lot to be desired. Every teacher needs to work within a continuing framework of staff development, supported by regular and appropriate in-service training. Unfortunately this is not provided adequately in many countries. As a result, the quality of teaching and learning is low.

Giving teachers additional tasks, such as contextualizing teaching and learning and integrating agroforestry and natural resource management concepts and skills into teaching programmes is hardly realistic without a concerted effort to address the quality of training which teachers receive, the range and quality of resources and materials available to them, and the support mechanisms which enable them to work efficiently and effectively.

There is also a critical financial issue, since many teachers working in basic education are paid extremely poorly, and have little or no say in decision-making processes. Efforts to improve the working conditions of teachers are required as a complementary measure to interventions in educational methods and pedagogical approaches. Coupled to this is the need to recognize the vital role which school managers, especially headteachers, play in supporting and leading their staff. Leadership and team-building of managers and directors need special attention to ensure that these key persons can create an enabling environment for improved teaching and learning strategies to operate and function effectively.

## Possible areas for action

- Support to teacher-training programmes (pre-service and in-service) in alternative teaching/ learning strategies and methods (including knowledge and skills in contextualization of the curriculum) of relevance to the 'Farmers of the Future' approach.
- Development of relevant learning materials, concerning content (technical resources on natural resource management) and processes (alternative pedagogies, learning management approaches).
- Training for school directors in leadership and team-building approaches.
- Identification, recognition and encouragement for schools where innovations are taking place (development of incentive schemes, competitions, awards, exchange visits).
- Strong advocacy campaign for greater decentralization of decision-making and management over resources needed for 'Farmers of the Future' activities to school directors and teachers.
- Development of linkages between natural resource management research sites, especially those in which community members are active collaborators, and schools/institutions providing basic education.

## Case study:

## Research on teacher training and innovative teaching methods

A research study entitled Bridging the gap between home and school' examined what children had learned before coming to primary school in Ethiopia, Egypt, Jamaica and Indonesia. The findings of the research demonstrated that the life experience which young children bring to primary school is greatly underestimated in terms of the level of the curriculum, and dominant pedagogical practices fail to build on existing knowledge and experience. The way that children are then conditioned to learn in school (passive listening) is significantly different to the way in which most young children have already learned to learn in their pre-school environments of home and community (play, active participation, practice). The research has important implications for teacher development: The most effective way to develop active learning skills in student teachers is to use participatory teaching methods in training student teachers. This can ensure that student teachers use their existing experience and knowledge to actively learn using what they already know as a starting point and then deepening and extending that knowledge' (Sylva and Siraj-Blatchford 1995).

## 4.4 Teaching and learning resources

Educational institutions, especially in the rural areas of many developing countries, often lack the necessary teaching and learning resources in support of their curricula. Even when they are available, underprivileged parents, already burdened by expenses related to shelter, food and health, may also find it very difficult to pay for education and the corresponding learning materials required.

In many countries in the world, the use and publication of teaching resources is strictly controlled by the government through education ministries. Schools themselves may also have well-defined criteria and regulations to this effect. It can therefore be quite challenging to adapt existing materials or to produce new ones.

If teaching and learning are to be effective and benefit learners, as well as the communities they live in, supporting resources must be produced or adapted to reflect local needs, opportunities and constraints. Ideally, this must be done using a participatory approach that involves resource persons, communities, teachers and learners contributing to all stages of the development of teaching materials - incorporating their identification, production, review, evaluation and testing.

Apart from textbooks, there are many other possible formats that can be used for the development of appropriate educational materials that have the potential to actively engage the learners in the teaching and learning process through experiential learning and real-world problem solving.

## Possible areas for action

- Review of existing and available teaching materials and recommend the inclusion of agroforestry and natural resource management topics.
- Encouragement of the use of agroforestry and natural resource management information to contextualize other teaching materials.
- Development of complementary and innovative materials on agroforestry and natural resource management that can be used in addition to officially recognized teaching materials.
- Organization of participatory teaching materials development workshops aimed at producing relevant teaching materials at local levels.
- Adaptation and translation of existing relevant teaching materials to suit local conditions.
- Promotion of modern information and communication technologies that allow educators to access recent and high quality information.

Case study:

# Action, an environmental and health education project in Southern Africa

Action is an environmental and health education project that researches, develops, and publishes education and training materials for children, teachers and their communities. A high priority has been to develop locally relevant education materials with interesting, engaging activities that use available resources. In its efforts to make its materials more accessible to the target group, Action carries out environmental education research, training of teachers on how to use the resources with pupils, and has back-up library and documentation services for teachers, researchers, community members and learners.

Action has produced a magazine and teacher guide on agroforestry. The magazine explains what agroforestry is by means of a comic strip. The teacher guide contains background information about agroforestry and ways of bringing agroforestry concepts to the pupils, such as an agroforestry survey, tree adoption, picture poetry, agroforestry games, tree stories, tree identification or setting up a school nursery.

Started in 1987, Action magazine is now read by about 1.5 million school children and 100,000 teachers in 15,000 schools in six nations of Southern Africa: Zimbabwe, Zambia, Botswana, Namibia, Lesotho and Swaziland. The information in Action magazine is written and pilot-tested with school children and teachers across the region before it is published, making certain that the information is appropriate and interesting. The cooperation of the six Ministries of Education and curriculum development offices makes it easier to develop, test and distribute the material. The topics relate to the dependence of the communities of Southern Africa on the natural resources around them. Actions approach to environmental education recognizes the inseparability of conservation, rural development, political empowerment, and survival; its training programme enhances the work of community-based natural resource management programmes (Murray 1999).

## 4.5 Pilot sites as learning cases

In order to effectively shape, test, monitor and evaluate innovative approaches to basic education such as 'Farmers of the Future', pilot sites are essential and can indeed be used as learning cases, before its implementation on a larger scale. Pilot sites need to be carefully selected:

- Pilot sites need to be representative of a larger area.
- Pilot sites should have possibilities for on-site demonstration and teaching.
- Liaising with families and communities will help in contextualizing teaching and learning.
- Linking with partners and collaborators will help in implementing an integrated and relevant approach.

Monitoring and evaluation of pilot projects allows implementers and their partners to learn from successes and failures. The monitoring work needs to be designed and conducted systematically and administered by a joint team of professionals from different disciplines and stakeholders. Proper linkages for conducting inventory and documenting feedbacks need to be in place.

Feedback on lessons learned from the monitoring and evaluation process needs to be provided to participating partners. Lessons learned from monitoring, evaluation and analyses can also be published and disseminated to a wider audience of stakeholders. Vital to the process is an effective mechanism for ensuring that lessons learned are fed back into the activity-planning process.

### Possible areas for action

- Identification and selection of pilot sites and multidisciplinary teams to effectively test and shape approaches and activities.
- Development of pilot projects (e.g. teacher training, development of lesson plans, textbooks, establishment of school tree nurseries, school gardens, demonstration plots) for pilot sites.
- Design of appropriate monitoring, evaluation and feedback systems.
- Creation of opportunities to communicate and share efforts and learning experiences, highlighting common threads, examples of strategies that work, and guidelines for developing new projects.
- Identification of practical mechanisms and models for scaling up successful pilot strategies.

Case study:

## Supporting pilot activities in education: Oxfam in Vietnam

In 1994, after working in the education sector over several years, Oxfam in Vietnam started to support a small pilot project that fostered innovative teaching methodologies. These had been developed successfully in other countries, including Bhutan, where they had enhanced the educational attainment of children. A small group of teachers was brought in to train Vietnamese teachers in child-centred, activity-based methods. The foreign teachers worked directly with Vietnamese teachers and education officials over several weeks, to demonstrate how these methods could be used to motivate and engage children who might otherwise find the lessons uninteresting.

From the outset, Oxfam has worked with staff at the Vietnamese Ministry of Education and Training (MOET) and relevant donors, UNICEF in particular, to identify parts of the methodology training that were proceeding well, or faltering, and to adjust the activities accordingly. At the end of the initial demonstrations in 1994, the Vietnamese and foreign specialists together identified the areas of potential success and failure at a large workshop. A booklet was published to disseminate the information more widely in Vietnam. Experiences have been shared regularly through the Vietnam Education Forum, to provide feedback to MOET staff at central and local levels, and to staff and partners in relevant international institutions.

Providing funding and 'pilot classrooms' for such innovation has been a small but valuable contribution to the development of education in Vietnam, especially as MOET has now endorsed the idea of new teaching methodologies (Watkins 2000).

## 4.6 Tangible benefits

Projects and activities aimed at introducing agroforestry and integrated natural resource management in formal and non-formal education systems will lead to the acquisition of knowledge, attitudes, skills and values that can ultimately contribute to broader economic, social and environmental gains.

Agricultural and natural resource management enterprises such as school gardens - producing vegetables and fruits - as well as the production of timber and non-timber trees, can directly contribute to income generation and a reduction of expenditure related to these products as a result of self-sufficiency. Such enterprises may also create employment and business opportunities for surrounding communities.

Education systems can provide a useful mechanism for addressing health and nutrition problems. Schools can provide a focal point for community health and nutrition efforts. In the context of HIV/AIDS, tangible benefits are situated in the above-mentioned area of income generation, but also in labour-saving technologies, and in health and nutrition. Agroforestry research over the past 25 years has indeed identified some viable labour-saving technologies. Many agroforestry products (e.g. fruits, milk) have direct nutrition benefits.

Formal and non-formal education institutions operate in well-defined socio-cultural environments even though the linkages with them may not always be optimal. Teaching youth about topics that are directly relevant to their communities, such as

agroforestry, the environment and natural resource management, will strengthen bonds between schools and communities and possibly create more involvement of these in the teaching and learning process. This can also reverse the trend of seeing education as a way out of rural life and poverty once rural communities realize that sustainable farming is a viable option providing for a good livelihood.

People and governments worldwide are increasingly concerned about environmental issues and the degradation of the natural resource base. Research has clearly shown that trees can make significant contributions in addressing some of these such as soil erosion control, soil fertility improvement, biodiversity enhancement and global warming reduction.

## Possible areas for action

- Establishment of school farms, gardens and demonstration plots that include agroforestry options allowing the practical and contextualized teaching and learning of various related subjects.
- Introduction of simple transformation and processing techniques that add value to products and provide business and market opportunities.
- Linking schools and communities through consultation, field days, training and other mechanisms.
- Development of partnerships between schools and organizations concerned with environmental issues.

Case study:

# Kitchen Gardening for Better Nutrition in Bhutan

Food self-sufficiency, utilization of natural resources, and the improvement of the income, living and nutritional standards of the rural population are priorities for the Royal Government of Bhutan. Most of the population of Bhutan lives in remote rural areas and suffers from malnutrition, causing problems such as anaemia and possible vitamin A and iodine deficiency, particularly in women and children.

Kitchen gardens have been established at local schools, integrating farm enterprises in the schools through intensive animal husbandry, horticulture and small-scale processing. These enterprises generate income for the school and allow the community to contribute.

In addition, demonstration kitchen gardens near farmhouses were established. Schoolteachers, agricultural extension agents, health workers, households, students, support staff and volunteer farmers were trained in techniques of fruit and vegetable production, processing, preservation and consumption aimed at better nutrition. Techniques for water collection and use of organic manure for improving and maintaining soil structure and fertility were provided by extension staff in training workshops.

A well-implemented management system evolved from the very beginning between the teachers and parents in the programme. The kitchen garden programme was already being replicated in all blocks of the pilot districts by the end of the project. The community approach of this project helped to overcome some typical problems associated with school gardening, such as neglect of gardens in school holidays, and the demand on teachers' and pupils' time in maintenance of the garden (FAO 2001).

## 4.7 Multi-stakeholder participation

Multi-stakeholder participation aims to bring together all major stakeholders. Accountable, responsible, innovative and equal partnerships are crucial for the integrated approach that 'Farmers of the Future' envisions. Indeed, collaboration with different organizations has been identified as a common element in the success of many youth programmes. A marriage of groups with common objectives enables an expended base for funding, expertise and meaningful activities.

A framework for multi-stakeholder participation that would enhance participation and facilitate partnerships is being considered as a necessary and constructive cornerstone. Such a framework should ensure a level playing field, be transparent, and based on mutual trust and respect of rights.

Natural resource management and pedagogical issues are nested in an interdisciplinary mix of scientific, social, economic, political and cultural aspects. Because of this complexity, 'Farmers of the Future' activities will be designed to include a variety of perspectives. A broad range of stake-holders will be identified and integrally involved.

In order for multi-stakeholder processes and partnerships to be successful, it is essential for each stakeholder group to have:

- clarity of objectives and roles in the partnership
- sufficient resources and capacity
- equal and timely access to reliable information
- transparency of processes
- respect for each other and equity among the major groups
- availability of effective structures and mechanisms for consultation and participation at all levels of decision making.

Four major stakeholder groups have been identified for 'Farmers of the Future':

1. Beneficiaries: children, youth, communities.
2. Implementers: trainers, teachers, schools, NGOs, CBOs, development agencies.
3. Facilitating organizations: research and development organizations, government departments, policy makers.
4. Investors: governments, development agencies.

## Possible areas for action

- Identification and involvement of key stakeholders - those who can help a project succeed and can help sustain it over time.
- Institutionalization of multi-stakeholder dialogue processes and networks at different levels to enhance partnerships.
- Integration of a component on partnerships in teacher/leader training.
- Involvement of children, youth, trainers, teachers, local residents and local leaders in project planning, decision-making, implementation and monitoring.

Case study:

# Training and Information Programme on the Environment (TIPE) in Mali

Mali is one of nine countries involved in the Training and Information Programme on the Environment (TIPE) through membership in the Inter-State Committee for the Fight Against Drought in the Sahel. TIPE is a good example of multi-stakeholder collaboration and participation at all levels, from international to local.

TIPE is a 10-year effort that began in the early 1990s and is funded by the European Union. In Mali, 320 public schools have adopted TIPE to date. This formal environmental education programme is introduced in all elementary grades. Curriculum and training materials are produced by a regional pedagogical committee. A national pedagogical committee in each country makes appropriate adaptations.

The TIPE strategy in Mali takes advantage of a site or piece of land adjoining the school, which is shared in some fashion with the community. Each school is required to set up a joint project with the local community and establish school-community liaison through a village follow-up committee, so local delegates can participate in decisions and monitor site use. Mutual benefit is the key to this school-community linkage. Some schools ask families to donate sheep and cow manure to fertilize school gardens, other schools lay out nurseries for vegetables and seedlings and get the village to establish a neighbourhood follow-up committee to help transplant them in public spaces. The headmaster at one school contacted government water and forest officers to organize a course for villagers on the proper care and pruning of trees. Another school requested outreach help from its association of women alumni. Yet another school worked with a Catholic youth group and the agricultural services agent to replant trees at two village sites. The school also found a partner to install a solar pump, giving the community access to drinking water (GreenCOM 2000).

## 4.8 Public awareness, advocacy and resource mobilization

Natural resource management education programmes depend critically for their success on effective advocacy and public awareness through information, education and communication. Experiences over past decades demonstrate that mass media campaigns do not change behaviour and that even the best-designed programmes can fail or produce meagre results, because decision makers and intended beneficiaries are not adequately consulted, informed, educated or mobilized.

Public awareness is only one element in a wider continuum of a communication process that includes advocacy, social mobilization and programme communication. Advocacy consists of the organization of information into an argument to be communicated through various interpersonal and media channels with a view to gaining political and social leadership acceptance and preparing a society for a particular programme. Advocacy leads directly to social mobilization. Social mobilization is the process of bringing together all feasible and practical inter-sectoral social allies to raise people's awareness of and demand for a particular programme, to assist in the delivery of resources and services and to strengthen community participation for sustainability and self-reliance. Programme communication is the process of identifying, segmenting and targeting specific groups/audiences with particular strategies, messages or training programmes through various mass media and interpersonal channels, traditional and non-traditional (McKee 1992).

Awareness of teachers, parents, community leaders, policy makers and politicians determines the support for initiatives such as 'Farmers of the Future'. They need to be convinced of the benefits and the essences of the initiative. Since men and women often have different roles and perspectives in natural resource management issues, both need to be consulted to determine if different messages should be developed.

Advocacy requires identification of important stakeholders, effective media and communication channels, as well as preparation of international

and national advocacy forums and events. Media can act as a key to catalyzing large numbers of citizens with information about natural resource management. Training for journalists and other personnel in the media world and the careful analysis of existing knowledge and behaviours are important components in effective media campaigns.

## Possible areas for action

- Formative research to define the problems, the perspectives, and the audiences for communication campaigns.
- Pre-testing information messages and campaigns with the intended audience to confirm their clarity and acceptance.
- Organization of information dissemination activities, field days, film, theatre and drama events, awareness creation workshops, etc.
- Training and capacity development of (local) media personnel in natural resource management education issues and reporting.
- Building directory of community, local, national, regional and international resources.
- Tracking and sharing of funding opportunities among partners.

## Case study:

# Education for Self Reliance in Tanzania

Noticing the difference in understanding and reflections between the government and the parents to agricultural education in basic schooling through the Education for Self Reliance scheme in Tanzania teaches an important lesson. The main goal of the government was to provide agricultural education to students so that the majority would pursue a productive life in farming, thereby remaining in rural areas. Students and parents on the other hand wanted academic education that would lead them to profitable urban-based jobs. Parents supported their children to get as far away from farming as possible, because they felt that their children might not make a better living than the parents themselves could make from farming.

But, the reality in Tanzania has been that about 80% of the primary school graduates remain in the villages to pursue a rural life. Therefore, making the public aware of the benefits of teaching their children in sustainable agriculture and natural resource management and the possibilities of raising their earnings to become competitive to urban-based jobs is crucially essential (Ngugi et al. 2002).

## 4.9 Strategy and facilitation for institutionalization

There are many success stories of educational interventions, but also many attempted interventions have not succeeded. A major constraint has been the institutional framework within which basic education is offered. It is vital to consider carefully the institutional set-up when initiating activities within the framework of 'Farmers of the Future', for example the way in which schools are governed, and where authority lies in decision-making. How can a vision for the development of an organization or institution within which a new approach to teaching and learning is introduced, be shared by all key stakeholders? Does the prevailing system of financial management support or hinder approaches which rely on greater decentralization of management of teaching and learning, right down to classroom level? Are teachers able to develop their own strategies and relate the curriculum to the local environment and to agroforestry practices? What is the role of community members in governance of schooling and basic education, and how can teaching programmes be organized to capitalize on the existing strengths at community level? What kind of capacity building activities are required to strengthen the way that institutions function, to enable innovative approaches within the 'Farmers of the Future' programme to be introduced? All these questions need to be addressed, in order to ensure the sustainability of successful strategies. Without complementary organizational development, at school level or within the organizations that support the school system, change is likely to be sporadic and short-lived.

### Possible areas for action

- Analysis of institutional and organizational capacity within each specific context, to support change through the introduction of alternative approaches to teaching and learning.
- Support to and facilitation of organizational development processes for mutual empowerment through change.
- Advocacy for decentralization of management of resources necessary for classroom based innovations.
- Identification of and support to 'champions of change' and activists, through establishment of networks and exchange programmes, and self-

help groups (including teachers, students, managers and community members) to sustain innovations.

- Encouraging debate on future trends in education and training of children and youth for agriculture, sustainable development, food security and natural resource management.
- Supporting institutionalization of natural resource management education by working toward national policies, teacher accreditation, sustainable teacher associations, improved teacher education institutions and local curriculum and teaching material development.
- Supporting partnerships for education for sustainable development at national, regional and global levels.

## Case study:

## The Childscope project in Ghana

The Childscope project in communities in Afram Plains in Ghana began in 1994 with an initial objective to develop a sustainable model for providing quality basic education in rural communities. It focuses on improving the education of the child through the joint efforts of the school, community and children, places strong emphasis on girls' education, includes a child-to-child approach and uses participatory rural appraisal type activities to explore the experience of children and the community. The curriculum is reshaped according to needs of the community, and life skills and teaching methods are linked across the curriculum.

The challenge was to institutionalize the Childscope approach through an expansion phase when the project moved from 12 to 76 communities. An evaluation stressed that the challenge for this expansion was to maintain the values and the integrity of the Childscope approach with an ever-broadening network of facilitators. During the expansion process, issues of facilitating conflict resolution, team management and development were all seen as important and needing support through training. A strategy was developed to use the existing Childscope project site as a training centre where others could learn from the approach and participate in the ongoing work of the team. (Miller and Pittman 1995).

## 4.10 Facilitation and management of the initiative

Even though formal and non-formal systems of education are well established in most developing countries, changes leading to the introduction of new subjects in existing curricula, or the contextualization of these, using agroforestry and integrated natural resource management will be challenging and requires the development and involvement of new, non-traditional education partnerships.

National education is the responsibility of ministries dealing with education and functions mostly within the well-defined boundaries of schools, national and local education authorities with rigid hierarchical structures, rules and regulations.

At policy and implementation level, international organizations such as FAO, UNEP, UNESCO and UNICEF, and others such as multilateral and bilateral donors, NGOs, CBOs, research and development organizations can provoke change in several areas.

Any project aimed at inducing change will need to involve effective partnerships between several of these.

Each partner involved must have a clear comparative advantage in a specific area and at a specific level and scale.

It is also necessary to have a coordinating mechanism responsible for the overall facilitation and management of the initiative including activities such as the development and marketing of specific projects and activities, monitoring and evaluation, synthesis and reporting, information and advocacy. Several models shaping this initiative and its coordination can be considered as long as they are flexible and maximize productivity and impact at all levels.

It can also be expected that such an initiative will grow organically and advance through experiences and pilot projects.

## Possible areas for action

- Creation of and participation in effective partnerships and networks, both formal and informal, at national, regional and international levels that promote the initiative.
- Establishment of a coordination mechanism that ensures active collaboration and information sharing through various means.
- Formulation of a clear strategy and framework for the initiative that includes monitoring, evaluation and impact assessment.
- Development of collaborative project proposals that mobilize human and financial resources aimed at implementing activities listed under all cornerstones.
- Conducting and publishing research on success and failure factors of similar initiatives.

# Case study:
# Eco-Schools programmes

**Eco-Schools was developed by the Foundation for Environmental Education (FEE) in 1994 and supported by the European Commission in the pilot years. The programme quickly grew as various member-countries realized the potential of the programme to implement policies for environmental education and awareness. Today, the Eco-Schools programme is active in 23 countries and in over 7000 schools. The progamme gets support from members, public institutions, and private-sector sponsors and partners, who contribute funds but also technical expertise.**

**In Africa, UNEP uses the concept to promote coordinated stakeholder participation in environmental management through environmental education and public awareness. The programme aims at achieving sustainable environmental management at the local level through schools. It offers a flexible way of supporting environmental education through integrating outdoor experiences with classroom studies and providing guidelines to the day-to-day running of schools. Recognizing that the Eco-Schools programme offers vast opportunities for implementation of local Agenda 21 in countries of Africa, UNEP, FEE, UNESCO, KOEE, WESSA and partners seek to find ways to implement the programme in Africa through a consultative process comprising relevant government officials and NGO's (UNEP 2002).**

# 5 Summary and way forward

Although the close relationships between poverty, lack of food, health and absence of education have long been recognized and understood, development strategies at national and international levels have tended to treat equitable access to quality education and food as separate issues. It is timely and essential to explore and implement practical and innovative measures in which the interrelated issues of education, food and health can be tackled together. The integration of natural resource management into basic education is an effective approach to accomplish this. Through a 'Farmers of the Future' initiative, the World Agroforestry Centre and its partners would like to provide an enabling environment for this integration.

The initiative aims at improving the quality and relevance of basic education through the integration of natural resource management. The outcomes from 'Farmers of the Future' are envisioned as:

- improving the agricultural and natural resource management knowledge, skills and attitudes of children and youth
- empowering young people by enhancing the effectiveness of formal and non-formal education through active, experiential and contextualized learning
- promoting the integration of sustainable natural resource management into basic education, contributing to the improvement of rural livelihoods, land use management and environmental conservation
- linking with and making good use of existing national and global policies and agreements
- bringing direct benefits to all learners and their families and strengthening linkages between schools, homes and communities, particularly in rural areas
- encouraging local and regional collaboration and networking through flexible participatory multi-stakeholder approaches.

'Farmers of the Future' is emerging as a result of successful experiences from around the world aiming to improve the effectiveness of basic education with a focus on agriculture, forestry, land and water management, sustainable development and/or environmental protection. A conceptual framework for 'Farmers of the Future', informed by these success factors and lessons learned, has been developed through a collaborative effort between a wide variety of stakeholders active in the areas of education and natural resource management. The ten fundamentals of the framework are central elements of successful interventions and are in systems interaction with the other elements. They also provide a checklist which can be used for self-reflection, evaluation and design of 'Farmers of the Future' interventions.

The framework for 'Farmers of the Future' can help in generating concrete schemes and approaches for the improvement of natural resource management education and its incorporation in basic education systems. The World Agroforestry Centre (ICRAF) and its partners wish to engage actively in the anticipated areas of activities. Projects within this initiative can address commitments to 'Education

for All' and 'Food for All' in a practical and meaningful way, by providing quality teacher and leadership training and support, institutionalizing innovative methods and approaches, influencing and supporting policy formation, implementation and maintaining effective partnerships and cooperation, and ensuring sustainability, resource availability and access. Some effective ways of moving forward are:

- capacity development and skills enhancement of teachers and trainers
- improvement of education by relating it to the local context and the needs of the local community
- development of relevant and effective teaching and learning materials
- exchange and documentation of experiences and lessons learned for wider dissemination.

As an important next step in bringing 'Farmers of the Future' into a working reality, innovative projects that are addressing the above issues will be developed in collaboration with beneficiaries, stakeholders, partners, collaborators and investors. We believe that this strategy document makes a solid contribution towards achieving this aim. As experience grows through activities and interventions within the initiative, 'Farmers of the Future' can bring together and synthesize these experiences and lessons learned and foster the dissemination of this learning into on-going and new projects. The framework with the ten fundamentals as central elements of successful interventions will thus become a conceptual, operational and learning frame for 'Farmers of the Future'.

**Universal primary education is a major priority, but a broader 'Education for All' case can be made for the contribution of basic education to sustainable livelihoods, the fight against HIV/AIDS and a sustainable environment.**

UNESCO 2002.

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