OFFICE OF THE PRIME MINISTER
**MINISTRY OF STATE FOR DEVELOPMENT OF
NORTHERN KENYA AND OTHER ARID LANDS**

GETTING TO THE HARDEST-TO-REACH:

A STRATEGY TO PROVIDE EDUCATION TO NOMADIC COMMUNITIES IN KENYA THROUGH DISTANCE LEARNING

MARCH 2010

Acknowledgements

Acronyms

ABEK	Alternative Basic Education for Karimoja
ABET	Alternative Basic Education for Turkana
ALRMP	Arid Lands Resource Management Programme
ASALs	Arid and Semi-Arid Lands
DL	Distance Learning
EFA	Education for All
EfN	Education for Nomads programme
GER	Gross Enrolment Rate
IIED	International Institute for Environment and Development
IRI	Interactive Radio Instruction
KBC	Kenya Broadcasting Corporation
KCPE	Kenya Certificate of Primary Education
KIE	Kenya Institute of Education
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MoE	Ministry of Education
MNKOAL	Ministry of State for the Development of Northern Kenya and Other Arid Lands
NACONEK	National Commission for Nomadic Education in Kenya
TSC	Teachers' Service Commission
UNICEF	United Nations Children's Fund

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Summary

1. Kenya has committed itself to the Millennium Development Goals, Education for All, and other education targets, but although its achievement in this respect is perhaps the best in Africa, it is unlikely to achieve these goals on present performance. The difficulty now is getting education to hard-to-reach children, especially nomadic pastoralists. The Government of Kenya needs a new strategy urgently if the goals are to be met, and herding and education reconciled. Such a strategy is outlined here, together with a three phase programme to implement it.

2. A National Commission for Nomadic Education in Kenya (NACONEK) should be set up as the driving force for nomadic education, but research and experimental work on nomadic education should continue in parallel while NACONEK is being set up.

3. The main target group are the hardest-to-reach children out of school. The strategy proposed here is concerned mainly with nomadic children, but other hard-to-reach children, as well as adult pastoralists, are also targeted. The strategy stresses family involvement in education, by encouraging parents to enrol with their children, and by providing learning materials for adults.

4. An educational strategy for nomads will combine different delivery methods (boarding and mobile schools, radio broadcasts) together with new approaches to the way education relates to pastoral livelihood concerns. The government should continue current experiments with a variety of delivery mechanisms while recognising the contradiction between pastoral livelihoods and conventional schooling. There should be major evaluations of the impact of these approaches in two to three years.

5. The educational use of radio has great potential but little progress has been made so far in harnessing it for nomadic education. In the immediate future, priority should be given to developing and piloting a distance learning (DL) system for arid and pastoral areas based principally on use of radio, together with mobile teachers and printed materials. Community radios may be a suitable model for a radio-based distance learning system. The distance learning system and accompanying materials should be available to adults and children, and integrated where useful with existing boarding and mobile schools.

6. A plan should be elaborated through NACONEK to recruit, train and reward teachers for involvement in radio-based education in the unique conditions of the arid and pastoral areas.

7. Effective procedures should be developed for enrolling and keeping track of nomadic DL students.

8. The nomadic education strategy should use the national curriculum to ensure equivalence with the rest of Kenya. Adaptation of material to the specific conditions of pastoral livelihood systems should take place at the stage of design and production of radio learning modules, supported by a teachers' handbook developed for each district.

9. An evaluation/examination system should be developed which enables children to move back and forward between the DL programme and the conventional formal education system, and to acquire the same qualification at the end of their course (Kenya Certificate of Primary Education).

10. The government should closely monitor the implementation of the strategy and evaluate it in as much detail as possible as soon as possible. An M&E system must be developed which generates adequate data (on capital and recurrent costs, and wider costs and impacts) for a full evaluation of the distance learning process and how it compares to other ways of achieving the same objective.

11. A nomadic education strategy must be based on a positive attitude towards nomadic pastoral livelihoods. The strategy must incorporate as far as possible the views and opinions of the clients, that is to say the adults and children who are the students and for whom the educational system is designed.

12. Any outstanding legal issues raised by distance learning must be resolved.

13. The government should explore how to capture potential economies of scale created by a radio-based education system through collaboration across international borders where the same language is spoken on both sides.

14. The government should set up a scholarship fund to encourage outstanding nomadic students, especially girls, to continue to secondary school and university.

15. The proposed distance learning strategy for nomads should be fully costed in order to understand the implications of such a strategy and how it compares to other ways of achieving the same objective of education for all.

16. Kenya has made excellent commitments to nomadic education. The existing national policy framework is an optimistic and forward-looking agenda which sets out the main features and challenges of nomadic education. It calls for a new approach, able to go beyond forcing pastoralists 'to choose between herding and schooling'. The task is now to make this policy framework operational by filling critical research gaps and through experimental and pilot projects, and thus finally realise Kenya's education commitments to nomadic children and adults. This strategy proposes a three phased distance learning programme to accomplish that goal.

**GETTING TO THE HARDEST-TO-REACH:
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KENYA THROUGH DISTANCE LEARNING**

1. Introduction: nomadic education in Kenya

Nomads make up a significant part of the population of Kenya, but are falling behind in formal education. National gross enrolment rate (GER) was 107 percent in 2006, rising to 110 in 2008, but GER for nomads was below 50 percent, with some areas (for example the largely nomadic North Eastern Province) at around 25 percent; girls' GER was only half that of boys.[1] Based on 2008 figures it is estimated that in North East Province alone 70 percent of school age children are not in education.[2]

The problem is not only the poor attendance and graduation rates of nomadic children in school, but the damaging trade-off that nomadic parents and children have to make between acquiring formal education through the school system, and the fundamental, informal learning about their own cultural, social and economic world available to them as members of the complex social networks of nomad life. Such informal learning is crucial to a child's development. Current educational practices for nomads tend to result in an unfavourable choice between these two types of learning because of the forced separation of children in school from their family, their wider social environment and their cultural background. Some crucial challenges in the provision of education to pastoralists follow from resistance to this forced separation more than from a refusal of formal education itself.[3]

Education programmes for nomads tend to be an extension of those designed for sedentary people, and are based on a simple adaptation of sedentary models to some aspects of nomadic life. This approach has a poor record worldwide.

The aim of the strategy for nomadic education presented here is to recognise the unique nature of nomad education and to propose ways of reconciling the fundamental choices it faces. The problem is clearly recognised by the Kenya government and by international agencies working in this field. 'Education for all is more likely to be achieved if boys and girls are not forced to choose between herding and schooling' writes UNICEF.[4] The Kenyan Ministry of Education's nomadic education policy framework states: 'nomadic pastoralists require flexible education delivery modes that take into account their children's work at home'[5].

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[1] Ministry of Education, 2008, *Policy Framework for Nomadic Education in Kenya.* Nairobi. Para 1.1.5; *Ministry of Education, 2009, Education Facts and Figures: Update 1st October 2009* Anon, 2006, *Summary Report on Forum on Flexible Education: Reaching Nomadic Populations.* Garissa, June 20-23, 2006.

[2] MOEK, 2009, *Education Facts and figures: Update 1st October 2009.* Nairobi: Ministry of Education

[3] Kratli, S., C. Dyer, 2009, *Mobile Pastoralists and Education: Strategic Options.* Education for Nomads, Working Paper 1. London: International Institute for Environment and Development.

[4] UNICEF, 2007, *Nomadic Education in the Islamic Republic of Iran.* Eastern and Southern Africa Regional Office (ESARO)

[5] Ministry of Education, 2008, *Policy Framework* Paras 1.1.7.

The Kenyan strategy addresses that fundamental challenge: its vision is to develop a system which extends good quality formal education to all children living within nomadic livelihood systems or directly involved in pastoral production, without undermining the children's economic and social position in those livelihood systems. The strategy, the result of a partnership between the Ministry of State for Development of Northern Kenya and Other Arid Lands and the Ministry of Education, with technical assistance from the International Institute for Environmental and Development (IIED)'s Education for Nomads (EfN) programme, is based on a comprehensive review of the options and possibilities for nomadic education, on the different approaches governments have tried in Kenya and elsewhere and on ideas based on use of radio and new technologies.[6] The strategy will be implemented through a three phase programme: the first phase, recently concluded, was a ground clearing exercise which led up to the 2010 Nakuru workshop at which the strategy to achieve full nomadic enrolment was approved; the second will involve basic research and pilot activities; in the third phase a tested programme will be rolled out across the country.

The strategy also recognises that many adult nomadic pastoralists are enthusiastic about acquiring education for themselves, both because of its intrinsic value and because they want to know what their children know. The situation now is very different from 15 years ago when most Kenyan pastoralists had a negative attitude to education. During the consultation work undertaken so far, adult pastoralists expressed a strong desire to learn about economic and political themes that directly affect them, as well as civic issues and other aspects of being a Kenyan. The strategy includes measures to promote adult education among pastoralists.

2. Policies, goals and objectives

Kenya Vision 2030 sets out ambitious goals for education.[7] Targets to be met include 95 percent net enrolment by 2012, and education for all by 2015.[8] The number of boarding and mobile schools will be increased and alternative models of education provision will be developed in pastoral areas, including the use of new technologies.[9] Sessional Paper No 1 of 2005 commits government to providing extra resources for the development of infrastructure in regions with high poverty levels, including ASALs.[10]

The policy framework commits Kenya to providing universal access to basic education and training. This is interpreted as

- *equality of access* (including boys and girls, rich and poor, people from different livelihood systems and different geographic areas, and providing nomads with education of a quality equal to the rest of the country),
- *equity*,
- *quality*,
- *relevance*.[11]

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[6] Kratli and Dyer, *op. cit.*

[7] Government of Kenya, 2007, *Kenya Vision 2030*

[8] Government of Kenya, 2005, *A Policy Framework for Education, Training and Research.* Sessional Paper No. 1 of 2005. Nairobi: Ministry of Education, Science and Technology, p. 30

[9] *Vision*, p. 77.

[10] GoK 2005, *Sessional Paper, op. cit.*

[11] Government of Kenya, 2005, *A Policy Framework for Education, Training and Research.* Sessional Paper No. 1 of 2005. Nairobi: Ministry of Education, Science and Technology; and Ministry of Education, 2008, *Policy Framework for Nomadic Education in Kenya.* Nairobi.

The framework insists that the approved national curriculum should be consistent with nomadic patterns and lifestyles. It supports partnerships with other actors. It envisages the establishment of an effective institutional framework to oversee nomadic education and integrate it into the national education system.

These are not trivial objectives. The policy framework implementation plan estimates there to be 900,000 children out of school in parliamentary constituencies categorised as nomadic.[12] Some 300,000 nomadic children are currently out of school in North East Province alone. In Kenyan law, every one of these children is entitled to free quality basic education.[13] The policy recognises the need to target nomad communities and the challenge that this poses: 'the needs of nomadic communities are generally complex and … those providing education face even more challenges' (1.1.3).

The main institutional innovation proposed is a National Commission on Nomadic Education in Kenya (NACONEK) whose purpose will be to formulate policies and guidelines, mobilise funds, create mechanisms to coordinate and evaluate the activities of agencies in the field of education, ensure that nomadic education reaches across district boundaries, establish linkages with other Ministries, establish standards and skills to be attained in nomadic schools, prepare statistics, and channel external funds to nomadic schools.[14]

Despite these good intentions, the policy recognises that nomadic pastoralists are falling behind in education. They face many barriers in getting into and completing basic education, and thus lag behind children from other parts of Kenya.[15] The policy framework highlights the fact that efforts by any government to expand formal education provision based on a model of what works in towns or sedentary farming communities is not enough to ensure that EFA reaches nomadic communities.[16]

Kenya has made excellent commitments to nomadic education. The policy framework is an optimistic and forward-looking agenda which sets out the main features and challenges of nomadic education. It calls for a new approach, able to go beyond forcing pastoralists 'to choose between herding and schooling'. The government recognises that many approaches have been tried, with limited success, and that new strategies are needed. Mobile schools are playing a useful role but have not been mainstreamed and do not meet the needs of the majority of herding households..

This agenda is encouraging because Education for Nomads' recent work on pastoral attitudes to education shows clearly that children and adults now fully understand the importance of education and are enthusiastic about learning.[17] There is little or no resistance among pastoralists to the idea of formal education. The main obstacle now is effective access to education, as pastoralists, in a system that remains anchored to the classroom model of teaching. This model is not serving the interests of children and adults involved in pastoral production. A new strategy is needed.

The Distance Learning (DL) strategy laid out here directly addresses the challenge laid out clearly in the government's nomadic education policy framework and the

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[12] *Implementation Plan* 2.2.2.2

[13] *Policy Framework* 1.3.2

[14] *Policy Framework* pp 13, 14

[15] *Policy Framework* 1.3.1

[16] *Policy Framework* 2.3.12.

[17] IIED, 2010, *Results of future scenario planning with nomads in Kenya.* Forthcoming.

difficulties encountered so far in delivering high quality education to nomadic children. It is an open learning framework designed to eliminate unnecessary barriers to learning.

3. Nomadic pastoralists and educational delivery

Nomadic pastoralists are a majority or significant minority in all ASALs districts, and they occupy a large part of the national territory. Current ways of delivering education to such a significant, scattered, and mobile population are failing to reach pastoral producers, and the content of education when delivered is inadequate.

3.1 Nomadic pastoralists: numbers and distribution

In Kenya there are eight main pastoralist language groups. The first language of around 2.5 million people belongs to one of these groups. Table 1 shows the number of people in each pastoral language group and their geographic area. Not all these people are nomads, but a substantial proportion are.

Different nomadic groups organise their livelihood in particular ways. Households group together to share herding tasks in the season when animals are watered or when labour demands are high for other reasons. At other seasons households may be divided, with the productive animals in a satellite camp some way from the main household. Different groups have different patterns of movement and dispersal, some (like the Gabbra *yaa*) determined by customary political organisation, others (like the Turkana *adekar*) more by ecology or security considerations. These movement and settlement patterns are a critical influence on how many children are present in a particular area at a particular time and would be available for learning.

Not enough is known about the numbers, distribution, residence patterns and movements of nomads in Kenya, but these things are critical to a well-targeted plan. It will be important within the new strategy to define more precisely the target group by further researching the size, structure and changes in composition of pastoral camps and their movements over the seasons (in good years and bad), and by getting an insight into the links between poverty and marginalisation on one side and education on the other.

Kenya is experimenting with different educational delivery systems to reach the children in these nomadic groups. These experiments are valuable assets and have a potentially important role in the proposed strategy, although they do not provide the full answer.

Table 1. Distribution of pastoralists and pastoral languages

Language	Distribution	Estimated Population in Kenya
		Year pop. Pop. Est. 2010
Boran, Gabbra, Orma	Eastern Province, Marsabit, Isiolo and Moyale districts	(1994) 139,000 176,000
Daasanach (Merille)	Eastern Province, Marsabit District, Lake Turkana northeast shore, Illeret area	(1999) 8,000 9,000
Maa	Rift Valley Province, Kajiado and Narok districts.	(1994) 590,000 749,000
Pökoot	Rift Valley Province, Baringo and West Pokot districts	(1994) 264,000 335,000
Rendille	Eastern Province, Marsabit District, between Lake Turkana and Marsabit Mt	(1994) 35,000 44,000
Samburu	Samburu District, Lake Baringo south and east shores; Rift Valley Province (Chamus), Baringo District.	(2006) 174,000 185,000
Somali	Northeastern Province, Wajir area	(2000) 420,000 487,000
Turkana (Nga-karimojong)	Rift Valley Province, Turkana, Samburu, Trans-Nzoia, Laikipia, Isiolo districts, west and south of Lake Turkana; Turkwel and Kerio rivers.	(2006) 451,000 479,000
TOTAL		2,500,000

Source: Original data from: Lewis M.P. (ed.) 2009. *Ethnologue: Languages of the World*, Sixteenth edition, SIL International, Dallas, Tex. Estimates for 2010 made for this document. Net population increase estimated at 1.5% per year.

3.2 Boarding schools

Boarding schools are a good option for a small minority of nomadic children. Many active pastoralists who use school services for some of their children prefer boarding schools to day schools. The main reason is that boarding schools allow the herding household more independence from settlement life. Girls-only boarding schools have increased the average enrolment of girls in their catchment areas. On the other hand, like day schools, boarding schools still require the separation of children in education from the rest of the family and thus cannot serve children who work in the household. They are also not appropriate for children under the age of ten. Boarding schools are effective in socialising nomadic children away from their own communities. As evidenced from the community consultations to date, boarding schools will have a continuing role to play in a DL strategy for nomadic children.

3.3 Mobile schools

There are now about ninety mobile schools, including around fifty funded by the World Bank Arid Land Resource Management Project (ALRMP) in six arid districts.[18] Teachers are attached to a nomadic family or group of families. By day, children too young even to herd small stock attend the school; at night the older children, who have spent the day herding sheep and goats, attend. After three years in the mobile school it is planned that children will enrol in conventional boarding schools.[19] Thirty teachers are paid by the World Bank, other costs by the Ministry of Education. The schools are supervised by district education boards. Often adults as well as children attend the school.

The advantage of this system is that children do not have to leave home, can continue their household work and there are no hidden costs. Per student they are expensive because of the small number of students. Mobile schools are difficult to staff, manage and monitor. Often unqualified teachers are faced with multi-grade teaching requirements and little support from teaching and learning materials. Moreover, households can scatter at any time, causing children to move in and out of the system with negative consequences for a classroom-model of teaching based on continuity of attendance. In practice, most mobile schools tend to fill a service gap in relation to semi-permanent settlements and do not reach the most mobile households. However mobile schools may have a role in a DL strategy for nomadic children.

3.4 Sedentary schools for mobile populations

Alternative Basic Education for Turkana (ABET) has set up learning centres at semi-permanent villages near important roads. In Samburu district, shepherd schools (*Ichekuti)* are evening classes in conventional schools for village children who spend the day herding. Mainly girls attend.[20] In Marsabit the shepherd schools are evening classes in the mobile schools and are mainly targeted at the children who have spent the day out herding sheep and goats.

3.5 Content and focus of existing education programmes for nomads

Schooling options which require a teacher in front of a class can only cater for a small proportion of the children in pastoral households, typically those not directly involved in production. But the real lack of success of conventional models of delivering education to pastoralists is only part of the problem. A larger and more complex problem is the nature of the education on offer itself.

For nomads principally involved in animal production in the drylands, formal school-based education has three serious consequences:[21]

- The household has to be split in a way that makes school attendance easier but makes running a pastoral enterprise more difficult;

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[18] Wajir, Garissa, Moyale, Ijara, Turkana and Samburu.
[19] Ministry of Education, 2008, *Report on the Policy Framework for Nomadic Education in Kenya.* Nairobi
[20] Ministry of Education, 2008, *Report on the Policy Framework for Nomadic Education in Kenya.* Nairobi
[21] Kratli and Dyer, 2009, op cit

- Herd management and livestock mobility patterns have to be modified in ways which have negative impact on their productivity and ultimately on the reliability of the production system;
- Some but not all the children in the family will be enrolled in school, creating at an early age a separation between the educated children whose best hope in life is outside the pastoral system (and who indeed often lack the skills necessary to be effective producers in a pastoral economy), and the other children whose skill is in animal production and have little experience of the world outside pastoralism.

There is thus a problem at the heart of efforts to carry formal education to pastoralists through the school model. This problem is compounded by material shortcomings in pastoral schools themselves: especially a shortage of qualified teachers from the pastoral communities, with the necessary background understanding of local language and pastoral livelihoods, as well as a lack of appropriate teaching and learning materials. There is little monitoring or evaluation. Ultimately, education programmes using variations of the classroom model of teaching drift towards targeting those children who are or can be disengaged from pastoralism and could in principle go to ordinary schools.

4. Distance learning

A Distance Learning (DL) approach provides ways to by-pass the problems discussed in the previous chapter. In distance learning systems a significant proportion of the teaching is conducted without face-to-face contact, through a technology medium (for a long time books, now also radio). By operating outside the classroom model, DL can be more flexible and better able to adapt to changing circumstances, while maintaining standards as high as those in a conventional school system. A DL strategy uses a wider range of delivery mechanisms than in the past, bringing together boarding and mobile schools as well as radio instruction. At the same time the content can be better adapted to the significant differences in livelihood between urban and settled farming areas on the one hand, and the arid and semi arid pastoral areas on the other.

4.1 Use of radio for distance learning by nomads

A distance learning system designed for nomadic education in Kenya would integrate innovative uses of radio with the relevant parts of the existing school system and a new distance learning system within a new framework put in place by the Ministry of Education and the Ministry of Northern Kenya jointly through the proposed new National Commission for Nomadic Education in Kenya (NACONEK).

Such a framework at present disposes of four potential categories of radio asset for an education programme. These are discussed in greater detail in the Annexe:

- the *Kenya Broadcasting Corporation (KBC)* system of national broadcasting with near-universal coverage throughout Kenya; KBC has substantial experience in distance education by radio with an Interactive Radio Instruction approach (IRI) requiring a teacher in front of a class (as opposed to addressing students individually and without the necessity of a teacher);

- *community radio*, with uneven but widespread coverage depending on existence of transmitters, their power, and local topography; the local nature of these radio stations will allow for easy access by students and make it

relatively easy for the DL team to visit students in order to record materials for community broadcasts;

- the *Afristar satellite*; its main advantages are independence from infrastructure; uniformly high quality of signal in any location across huge areas; and particularly the possibility of reaching people irrespective of their location, would be advantages. It would be expensive, but costs are falling;

- the *cell phone* network may have a role to play in enabling teachers to keep in touch with their programme base; and by hosting FM repeaters on its masts.

4.2 Comparative advantage of different delivery technologies

A preliminary comparison (in annex 1) of the three most viable options suggests that community radio leads on almost all criteria. There are cases where KBC would be helpful. Afristar may become a viable option in the future when prices drop.

4.3 Receivers

Hitherto DL experience with children in Kenya has generally used a classroom model of teaching, with group listening and a teacher operating the audio device (radio, CD player, or tape recorder). Providing a sustainable educational service to nomadic children will require the capacity to reach students one by one and independently from one another, rather than necessarily as a class with a teacher.

Students should have direct access to the audio units of the DL programme (using them in combination with printed materials and tutoring from visiting teachers). The main target group will be children and adults in non-literate households. They will use the DL programme in an extreme environment, with high operating temperature and dust. They will need to access the right frequency, listen to the full range of DL broadcasting and play back at will the individual audio units of the core subject-modules. It is likely that the DL programme will require low-cost devices with a playback function, easy to use and to power, and capable of storing and retrieving audio units.

A comparison of standard radios devices (off the shelf), tailor-made devices, and non-networked devices (such as CD players and tape recorders) is made in annex 1, table 4. In the present state of knowledge a tailor-made device can best meet all the requirements. But this situation is changing rapidly and needs to be monitored.

4.4 Cell phones

The DL programme could be greatly strengthened by a reliable communication system, of the sort cell-phone networks can provide. In a DL system for nomads, communication between the field components of the programme as well as with the M&E and coordination and management staff will be essential. Visiting teachers will need to maintain regular communication with the radio station and with the supervising body, as well as whenever possible with individual students.

At present cell phone network coverage is uneven, especially in the north, but improving. As network coverage and cell-phone usage expand in the north, cell-phones could play a more direct role in education provision.

Linkage to cell phone networks could have other benefits. For example, the programme will investigate with cell network providers the possibility of putting repeaters for DL signal frequencies on their masts.

5. Strategy overview

A DL programme can be constructed in several ways. The following set of proposals are the system recommended on the basis of EfN research so far, but there are others which need to be explored.

5.1 Main actors

Key actors in a DL system for pastoral education will have different needs and requirements. The programme should plan for three main sets of actors.

(i) Students: families (children and adults) unable to use the present school system

Nomadic families are widely scattered in remote regions, mobile, and dynamic, their size and composition changing according to season, security and environmental conditions. These are populations with diverse production strategies and livelihood conditions; to reach them all with education presents challenges of various natures and degrees. Students, whether children or adults, should be addressed within family learning groups since the family structure critically supports or undermines incentives for learning.

Students in this group are likely to be:

- of all ages (although the programme will initially focus particularly on primary school age children); the age of students will influence learning patterns, which must be supported appropriately;
- engaged in production (it is likely that the students will be occupied with crucial work commitments in the family pastoral business, and will be therefore only partially free for any form of learning);
- unpredictably mobile (mobility will have different degrees of intensity and predictability: the strategy assumes mobility will be frequent and unpredictable);
- scattered over a huge remote regions (the strategy assumes that communities are not consistently large enough to provide a core number of children to work as a class);
- living in dynamic social aggregates (the strategy assumes that it cannot rely on a stable group to work as a class);
- living in remote and harsh rural conditions (it is likely that students have poor shelter from the vagaries of the weather, plenty of dust, no power, no light at night, only occasional mobile network coverage; only occasional access to markets and to medical services);
- illiterate and living within a largely illiterate community (the strategy assumes that no one within the community can read and write);
- individuals or families; where possible, for example where two or three households habitually camp together, a small group may be formed, composed of adults and children, to support its members' learning.

The main target group of this programme is the hardest-to-reach children currently out of school. At this stage the strategy is concerned mainly with nomadic children in their family, since they are the ones requiring the most radical new types of intervention, but other hard-to-reach children, as well as adult pastoralists, will also be targeted as the programme develops. The programme will define more precisely

its target group by further researching the size, structure and changes in composition of pastoral camps and their movements over the seasons (in good years and bad), and by getting an insight into the nature of pastoral poverty and marginalisation.

(ii) Mobile teachers

In a DL programme teachers range from classroom 'lecturers' to individual/small-group tutors. Whenever possible and cost-effective, these teachers will live with the community, like one of today's mobile teachers. However, the experience of mobile schools is that this is often very difficult to sustain. A better strategy may be to distribute teachers as in a cell system, with responsibility for all students moving through that cell (see section 5.7).

These tutors will need to be connected to the DL programme and their own group of students. They will need to access information, highlight challenges and receive feedback and support from the programme. They will need to locate their students and inform them before a visit. They will need occasionally to communicate with the students whilst they are far away at the boundaries of the cell.

(iii) DL team at the community radio station

These are the people operating the DL radio station (probably on the model of community radios and, whenever possible, as a DL unit attached to an existing community radio). These people will manage the broadcasting of DL units, pre-recorded at the district or Nairobi level, covering an adapted (but not diminished) version of the national curriculum. They will also design and produce side broadcasts to enhance local ownership and keep the DL programme alive and motivating. These side broadcasts will include relevant news and discussions. District Education Officers will be involved in these activities. Occasional guests, participants in the DL programme, and other members of the pastoral communities will be invited to the station. In order to allow community participation and ownership, the location of the radio station will need to be accessible by both teachers and students, probably in most cases at the district centre.

This strategy assumes that the DL team at the radio station will:

* have reliable access to a mobile phone;
* have access to a computer connected to the internet although most likely with a slow and discontinuous connection;
* have the possibility to broadcast information to the students and teachers of the DL programme, including a dedicated time slot;
* will link up with the DEO's office and be coordinated with district plans.

5.2 Community consultation

The target communities for each population to be reached with the radio programme will be consulted, using the scenario planning methodology, about the way they see education, what they expect and prioritise. The results will guide the way programmes are constructed. These exercises will also generate baseline data for monitoring and evaluation carried out later in the programme.

5.3 Enrolment and getting students started

At enrolment, children and grown ups are invited to attend an intensive recruitment and induction course. These courses (probably a maximum of one week) will be held

in a boarding school or at a town centre or market centre with boarding facilities, or even at large gatherings directly in the bush. During this time, students meet their DL tutors as families and are introduced to the programme: they learn how to use the receiving/playback device, how to communicate with the tutors, how to use the progressive testing system and the periodical exams. The timing of induction courses will be decided in the light of seasonal demands for children's pastoral work-load. Each student is given a receiving/playback device loaded with the first memory card.

5.4 Initial broadcasts

The broadcast cycle will start with a preliminary course. This will provide essential information and some basic functional literacy and numeracy for adults and children in the local language, designed to enable students access and use the main DL programme. Each audio unit will be accompanied by one page of printed material. This course is meant to generate interest in the DL programme and introduce to its use even those (children and adults) who have yet not managed to enrol. Every effort will be made in order to involve the entire household in the learning process, and not just isolated individuals.

In order to maximise access, especially at the start of the programme, the induction course should be made available several time a year in good years.

After the first four weeks of the preliminary course, the DL programme will start to broadcast subject-modules (sets of audio units designed to teach the subject-content of the formal curriculum) in the local language.

As students can learn in their own space and their own time (thus by-passing one of the main constraints of classroom settings), most modules can be designed for delivery as stand-alone.

Part of the available airtime will be used for extra-curricular, day-by-day locally produced DL side-programmes including relevant information, debates and interviews, and 'edutainment' content (educational entertainment). This 'community broadcasting' is intended to make the DL programme alive, to capture interest and foster motivation, participation and ownership.

5.5 Broadcasting schedule

The broadcast units should be aired more than once in order to give as many people as possible a chance to listen to them. Each unit should be repeated three times a day: morning, afternoon, and evening. Students' daily listening time is limited. The preliminary course should be aired on a dedicated frequency, three times a day, non-stop all year round.

5.6 Language

Following the present practice, subject-modules will be in the local language for the first two-three years of the curriculum. The programme will research the developmental status of pastoral languages and whether further development is needed.

The structure of the DL programme will allow the programme to offer, from Standard 2, a module of spoken English designed for non-literate students.

5.7 Supervision

A DL programme has to provide academic support, supervision and tutorial activities, designed to provide face-to-face contact, supervision and support for both children and adults. One way to do this is through a cell system of supervision. Each area where students are present for part of the year will be divided into cells: mobile households will come under the supervision of the tutor of whatever cell they happen to be in, and change tutor when they move to a new cell.

Such a strategy assumes the tutors/teachers will:

- live in villages or trading centres, within a distance of 10-30 km from their students, with responsibility for all students residing in or moving through the designated cell;
- visit their students or be visited by them for intensive face-to-face contact work. The intensity of visits – from once a week or more often to once every three months - will depend on the season, the momentary location of the student's household within the cell and the size of the cells.
- have access to a mobile phone, although not necessarily own one.

5.8 Quality control

In collaboration with existing Ministry of Education efforts at quality control, the programme will design a system of district/provincial supervision, support and quality control. The creation of a special cadre of travelling education inspectors will be experimented.

6. Programme operation and management

6.1 Institutional reform

(i) NACONEK

The creation of a National Commission on Nomadic Education in Kenya (NACONEK) has been recommended. Its purpose would be to formulate policies and guidelines, to innovate in education methods, to identify investment opportunities, and to address factors which impede nomadic education. It would also mobilise funds, create mechanisms to coordinate and evaluate the activities of agencies in the field of education, ensure that nomadic education reaches across district boundaries, establish linkages with other Ministries, establish standards and skills to be attained in nomadic schools, prepare statistics, channel external funds to nomadic schools, and advocate for nomadic education.[22] NACONEK would provide continuity, advocacy and networking on behalf of nomadic education.

(ii) Programme management

The DL programme will be managed through the Ministry of Northern Kenya and Other Arid Lands in liaison with the Ministry of Education and the Kenya Institute of Education during the experimental phase while its main activity is research and pilots (the 'thin slices'). During this period the Kenya Institute of Education should set up a unit on nomadic education which, in addition to providing a strong research department able to capture learning from the process as it unfolds, should share

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[22] Ministry of Education, 2008a, *Policy Framework op cit pp 13, 14*

project management with the Ministry of Northern Kenya. Precise operational details should be worked out early in the experimental phase. At the end of this phase, when research tasks have been completed, management responsibility will be wholly transferred to the Ministry of Education.

The complexity and logistic difficulties of a radio DL programme for pastoralists makes strong, high quality management essential.

6.2 Accessing the programme

Anybody should be able to access the DL programme irrespective of their other occupations. In order to enable maximum access and continuity, it should be possible for anybody interested in the DL programme to play back at will any unit of the programme, and start any subject-module at any time of the year, independently from the schedule of broadcasting.

6.3 Radio education and other delivery systems

As the community consultations have suggested, the DL strategy will need continuing networks of boarding and mobile schools in the ASALs to perform important tasks. Small high quality national schools with boarding facilities (rather than a single low cost boarding school per district) could absorb highly performing pastoral students who want to continue up to university. These facilities could also offer a logistic basis for intensive periods of training for both students and teachers operating outside the traditional school system, from induction courses to professional development courses and experience-sharing workshops.

Although designed principally to work with individuals without classes or teachers, the DL programme will also almost certainly prove of value to teachers and students in both boarding and mobile schools. A simple loud speaker device would allow teachers to use the broadcast as additional learning and teaching material. Children could also listen to the DL broadcast on their own outside school hours, as an additional source of learning and for revision.

There are already many non-governmental organisations, religious missions and others involved, generally on a small scale, in education provision at local level. The programme needs to negotiate a partnership with such organisations through the Ministry for Northern Kenya and the Ministry of Education.

6.4 Tracking student progress

Procedures will be developed to keep records of student progress in order to enable students to transfer back and forth between the DL programme and the conventional school system.

The DL programme will develop a system of 'point-based courses', including equivalence with conventional schools. Each module would be, as far as possible, stand-alone and individually assessed as part of a continuous assessment system similar to that used in conventional schools, probably carried out by a visiting tutor. By being positively assessed on a module by their cell teachers, students would be able to accumulate points that will give them access to an equivalent grade in a conventional school.

A points system would help counteract high drop out rates in boarding schools. It would allow students to complete modules and 'bank' points for classes completed, so they can use the points when they return to school later on.

6.5 Cross-border learning

Where the same local language is spoken on both sides of an international border there may be economies of scale to be captured by operating trans-nationally. Table 2 shows in simplified form the main places where this occurs on Kenya's borders. Work on nomadic education has started in neighbouring areas of Sudan and within the next two years is expected to make substantial progress in Ethiopia, Somalia, Tanzania and Uganda (through a new ABEK programme). Kenya should be aware of these developments and alert to the potential utility of cross-border coordination

6.6 Teachers

The Teacher Service Commission (TSC) will be responsible for recruiting and employing all teachers in the DL programme.[23] Although the DL system will operate at a distance and promote learning outside a classroom environment, the system will aim to maximise opportunities for face-to-face contact and two-way communication with teachers. Good teachers will be central to the success of a DL strategy. As nomadic education becomes effective and there are more graduates, many of the best teachers will be graduates from the nomadic education system itself.

Table 2. Cross border languages [24]

Language	Country	Estimated country population 2010 est.	Kenya population 2010 est.	Estimated regional population 2010 est.
Oromo/Boran	Ethiopia	10,152,000	176,000	10,328,000
Daasanach	Ethiopia	38,000	9,000	47,000
Maa	Tanzania	577,000	747,000	1,324,000
Pökoot	Uganda	89,000	335,000	424,000
Somali	Ethiopia	3,248,000	487,000	, 13,015,000
	Somalia	9,280,000		
Turkana & Nga-Karamojong	Ethiopia	27,000	479,000	718,000
	Uganda	212,000		
TOTAL	Total	23,712,000	2,233,000	**25,900,000**

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[23] For the moment teachers in mobile schools are outside this system. They eventually need to be brought within it.

[24] Excludes Rendille and Samburu who are found only within Kenya.

Source: Country populations: Lewis M.P. (ed.) 2009. *Ethnologue: Languages of the World*, Sixteenth edition, SIL International, Dallas, Tex. Regional population derived from sum of country populations. Estimates for 2010 as in table 1.

Teachers destined for jobs in the ASALs should receive additional training covering ASALs livelihoods, especially specialist courses on pastoralism. The minimum graduation exam grades required for teachers to be accepted into training need further discussion. Teachers should speak the same local language as their pupils and where possible should come from a pastoral background. Teachers destined for the DL programme will require adequate living conditions, training in operation and maintenance of equipment, and where necessary on the practical problems of living in the drylands. There should be possibilities for teachers to meet and share their experiences. Present DL in-service teacher training operations can be targeted specifically at the ASALs. The crucial question of how to ensure teacher quality needs to be addressed early in the programme.

Early childhood development teachers are being deployed across the country. The programme will lobby for some to be recruited to mobile schools, although this will not be easy.

7. Programme content

A DL education system does not mean that nomads should be provided with a second-class education or one substantially different from that available in the rest of Kenya. On the contrary the system should equip nomadic children to compete with children from elsewhere in Kenya throughout the school system and later in life as Kenyan citizens.

7.1 Curriculum

Kenya has a national syllabus for primary education which the KIE is mandated to develop.[25] In principle the nomadic education programme should use the national curriculum to ensure equivalence with the rest of Kenya. The DL programme will work with the KIE to analyse the existing national syllabus and in developing a programme based on the national curriculum and leading to the Kenya Certificate of Primary Education (KCPE). This might require minor modifications to replace a small amount of existing information with material based on a fuller understanding of pastoral ways of life, and reorganising the content (without reducing it) to fit into a module format. Adaptation of material to the specific conditions of pastoral livelihood systems should be reflected in a teachers' handbook, developed for each district, which sets out how to mentor children using the DL programme.

In addition to the national primary syllabus there are the more specialised syllabuses. For example, the Ministry of Education's Social Studies' Syllabus for primary education uses mainly situations and a vocabulary suitable for urban children or those in cash crop farming livelihood systems. Pastoralism is only briefly mentioned under standard seven.[26] Given the economic importance of pastoralism in Kenya and especially in the drylands, the presentation should be better balanced to provide

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[25] Kenya Institute of Education, 2002, *Primary Education Syllabus*. 2 vols. Ministry of Education.

[26] Kenya Institute of Education, 2009, *Primary Education Social Studies Syllabus.* Ministry of Education

substantial sections from standard five onwards based on the reality of pastoralism in Kenya today.

An ASALs curriculum development team should be set up jointly with KIE to research with pastoralist groups and where necessary adapt curricula to be used in radio broadcasts for nomadic education programmes.

7.2 Literacy

Literacy is currently taught as a part of the primary curriculum. The DL programme will experiment with intensive teaching of basic literacy and numeracy in local languages, for both children and adults, through radio broadcasting in combination with printed materials. Additional work by KIE to make some of these languages more easily used as languages of instruction may be necessary. Mobile/cell teachers will provide support for these intensive courses, particularly in the initial phase, but the aim should be to make literacy courses stand on their own in the future, once a critical mass of printed materials has been distributed across the communities and a critical number of people have become literate and can therefore provide help within the family.

7.3 Exams/assessments

Nomad children in Kenya are subject to the Kenya National Exams Council independent exams system based on standards set by KIE.

Exams should where possible be replaced with assessments at the end of particular modules or courses. Nomadic children at primary level will be aiming at the Kenya Certificate of Primary Education, as a marker of their initial achievement and as the condition of access to secondary education. The DL programme should offer intermediate certificates (for example one per module or small coherent set of modules). The students must be given the possibility to stop at any time without losing out on their achievements up to that point, and the possibility to pick up from where they left off if they have the opportunity to go back in education.

7.4 Learning materials

Newly literate adults and children need relevant and good quality printed materials, in addition to the foundation materials in support to the radio programmes, to be easily available. In the past, teaching materials for pastoralists have at times been inaccurate, out of date, and sometimes demeaning to the pastoralists.

Learning materials for the DL system will be both audio and printed. They should be explicit, comprehensive and of high quality with units and modules able to stand alone. They should also be very compact, since they will have to be carried when camps move location. Responsibility for their preparation will be held by the curriculum development unit set up under the supervision of NACONEK in the KIE. To ensure consistency between written and audio materials, and broadcast modules, the materials should be designed by the same team.

It should be a main responsibility of visiting tutors to distribute printed materials to students in their area.

7.5 The pastoral year

Pastoralists in the ASALs are mobile and adapt their movements and settlement patterns to constraints and opportunities. The DL system must adapt to this, especially through (i) a supervision system able to keep track of children as they move; (ii) recognition of times of high labour demand in the annual cycle when academic requirements (such as assessments or exams) can be relaxed; (iii) recognition of bad years when households and animals may move in unusual patterns or outside normal territories. It is also important to adapt the broadcast schedule to moments within the normal pastoral day when students are not fully occupied with pastoral tasks.

7.6 School culture

Historical evidence suggests that nomadic schooling has worked well where the local administrative culture was sympathetic to and supportive of pastoralism as a livelihood system (e.g. Mongolia, Iran), and has not worked well where it was not (everywhere else).

It is essential that the education culture, both in the radio productions and at any event where children meet teachers as part of their course, is well-informed and sympathetic to nomadic livelihood systems and pastoral societies. DL radio programmes must be designed to do this. Ways include encouraging a dialogue around radio broadcasts, with phone-ins, 'question-time' and debates. A 'radio mood' sympathetic to pastoralism must be created and sustained. Parental links to the education process and their participation in management decisions are essential.

These developments should as far as possible be led by the views and opinions of the clients, i.e. the adults and children who are the students and for whom the educational system is designed. Scenario planning provides useful methods to investigate these items.

An appropriate curriculum and a well-informed set of teaching and learning materials will contribute towards making education and the schooling experience culturally sympathetic to pastoralists and their living/learning conditions.

8. Additional major issues in a distance learning strategy

Several additional issues need to be resolved if a DL programme is to be implemented.

8.1 Scholarships and incentives

The proposed fund for girls' tertiary education in Northern Kenya should be supported in order to enable gifted girl students from all nomadic groups to go on to advanced education. Pastoral DL students with outstanding academic records should be supported to continue their education through a national school and up to university, and this system should be extended to benefit more students.

8.2 Monitoring and evaluation

Because of its experimental nature, it will be essential to monitor progress of the DL programme carefully and evaluate it regularly. Monitoring and evaluation must be results-based with visible indicators which can be understood by all stakeholders.

The success and sustainability of the radio strategy will depend in large part on four factors: (i) *reach* (how many communities and people it reaches); (ii) *quality;* (iii) level of *interest, involvement and ownership* by students and their families; and (iv) *quality of management*, supervision and support by the educational system as a whole. Indicators of these will be developed and monitored from the start. The scenario planning undertaken by EfN so far provides a methodology to do this, and a baseline in specific communities to measure changes in the 'after schooling' situation. Indicators should include impacts, outcomes, and costs.

8.3 Legal issues

The status of teachers in the existing legal framework needs to be clarified. Mechanisms and conditions of equivalence between the DL programme and conventional school system must also be clarified and formally recognised, so that students can move without trouble between DL and school system, and vice versa. Students in the DL system must be allowed access to the Kenya Certificate of Primary Education on the same terms as the students in the school-based system.

DL teachers should be fully recognised and have the same legal status and rights as conventional school teachers.

8.4 Comparative costs

In deciding the future shape and direction of DL for nomadic pastoralists in Kenya, it will be essential to be able to compare it in detail with a boarding and mobile school system capable of reaching the most scattered and remote nomad children and adults. For this the cost (capital and recurrent costs) must be known, as must the way costs and the quality of outputs compare with boarding and mobile schools. The DL strategy should be costed as soon as possible in order to have a basis for comparison with more conventional schooling as a way to reach the same number of scattered and remote children, with the same quality education. The proposed M&E system must be able to answer these questions.

8.5 Long term sustainability of funding

The proposed DL system is innovative and will have to be tested, evaluated, redesigned, developed and implemented at scale. Initial field tests and pilot trials of particular components of the system will carry substantial risks to students. The DL programme will protect students and their parents against these risks. Early in phase 2 the programme team will draw up a long term schedule showing how funding can be taken up progressively by the state budget with donor help, and how such a system can be made sustainable.

The programme aims at providing the basis for a long term educational technology adapted to the realities of northern Kenya. The projected life span of DL via radio is fifteen to twenty years. During this period the programme will continue to search for new technologies capable of continuing to deliver education to nomadic pastoralists.

8.6 Political commitment

The development of a DL educational system targeted principally at pastoralists will require large and sustained political commitment. At present such commitment exists, as shown by the creation of the new Ministry of State for Development of Northern Kenya and Other Arid Lands. It will be essential to push forward while this window is open and establish 'facts on the ground,' real achievements which will be

difficult to cancel later when perhaps the political spotlight has moved elsewhere. The creation of NACONEK is an important political commitment which would help achieve this.

8.7 Criteria for thin slice projects

The pilot projects will take the form of a thin slice across the entire radio broadcast education system: starting with rented or borrowed broadcasting and receiving/storage capability, going on to trial radio programmes covering key subjects including induction and enrolment, experiments with adapting curricula where necessary, and finishing with assessments, monitoring and evaluation. The aim will be to replicate at a small scale the entire distance learning system. Pilot trials will be monitored and evaluated in detail and the lessons made widely available.

In the thin slice projects, individual components of the DL system, on their own and in combination with other components, will be field tested and evaluated as to their potential contribution. Initially two or three contrasting pilot ASAL areas will be selected on the basis of the following criteria:

- contrasting environmental and livelihood characteristics including customary social organisation, patterns of settlement, level of mobility, and degree of market integration;
- gross enrolment rate stagnating;
- ready availability of capital equipment (especially radio broadcasting facilities – potential sources include community radios and excess Kenya Broadcasting Corporation capacity);
- willingness of district educational boards, communities, local leadership and all key stakeholders in education to participate in trials;
- potential to test all the underlying assumptions about appropriateness and effectiveness of using radio to educate children;
- areas where there is a push from nomads themselves for distance learning.

It must be made clear to participants during the initial thin slice phase that the activities are experimental and that extension of the distance learning will depend on a successful outcome of the pilots.

The start of the pilot projects will raise legitimate expectations in pastoral communities and strong hopes that a successful system will spread to their areas shortly afterwards. The pilot must also be designed with this in mind, so that if the programme is successful and lessons are learned about how to do DL activities in a pastoral context, there is a smooth extension of the strategy eventually to cover the whole pastoral ASAL area.

ANNEX 1

BROADCASTING OPTIONS

Kenya Broadcasting Corporation
KBC has substantial experience in distance education by radio with an Interactive Radio Instruction approach (IRI) requiring a teacher in front of a class (as opposed to addressing students individually). KBC has 24 unused FM radio frequencies in the ASALs. These would not be enough for the fully fledged DL programme proposed here which would require about nine per district) but this blockage is expected to disappear with the digital migration, as many more channels will be made available. Broadcasting through KBC would be based in Nairobi.

With KBC broadcasts, users of the DL programme would not be able to have direct access to the radio station, and so participation would be limited to KBC crews visiting a community. This would be a major obstacle to creating local ownership of the service.

KBC has both technical and methodological capacity, including broadcasting in most of the ASALs languages. However, given the fundamental difference in the approach between IRI and the DL system proposed here, this capacity is not entirely an advantage (and could perhaps get in the way of the necessary innovation). Moreover, KBC's DL and local-language broadcasting services are separate, thus the relevant capacity is split across different sections of the corporation.

At present, KBC sells its airtime and the continuous use of several frequencies would be expensive. Other costs would also be likely to be much higher than with a community radio, with little flexibility in the system.

Community radio model
Using a community radio model would probably require one station per district (boosted by repeaters if necessary). In the long term, each DL station would have to broadcast on several frequencies. However, only two frequencies will be required for the pilot project: one for the subject-modules and community-broadcasting, and one for the preliminary course (see section 5.3). In the longer term, the digital migration will make available a large number of new channels and frequency scarcity will no longer be a problem. In all cases, the FM spectrum is currently almost completely unused throughout the ASALs.

The local nature of these radio stations will allow for easy access by student and make it relatively easy for the DL team to visit students in order to record materials for community broadcasts. Training teachers to use low-cost portable recording equipment would also increase the opportunities of participation by distant communities by recording interviews and group discussions during routine visits.

Satellite broadcasting

Afristar broadcasts directly to receivers. The main advantages are independence from infrastructure; uniformly high quality of signal in any location across huge areas; and the possibility of transmitting multimedia files (text, photos and video as well as

audio). Of these three advantages, the last would be of no use to EfN, since the students cannot yet take advantage of such opportunities. The DL programme could however use them for getting materials to teachers and for in-service teacher training, but less sophisticated systems would work as well, for example loading the same information onto memory cards or CDs.

A uniformly high quality of signal, and particularly the possibility of reliably reaching people irrespective of their location, would be advantages, but even in this case there are caveats. The main problem is that satellite transmission requires a dedicated receiver. At the moment, those available on the market are bulky and expensive. Overall cost of satellite use is high.

The satellite option is an advantage for those few communities who live most of the time in areas shielded from standard radio broadcasting (e.g. behind mountains or at the bottom of deep valleys). However the cost of satellite broadcasting is not scalable. Even in those cases therefore, alternatives and targeted solutions might be simpler or more sustainable at present. But satellite potential should be kept in mind for the future.

Comparative advantages of different delivery technologies
A comparison (table 3) of the three most viable options suggests that community radio leads on almost all criteria. There are cases where KBC would be helpful. Afristar may become useful in the future when prices drop.

Table 3. Characteristics of radio delivery technologies for education

EfN requirements	CR	KBC	Satellite
Intensive use of airtime (10-16 hours per day on each frequency, every day of the year)	√		
Low cost receivers and playback	√	√	
Large number of FM frequencies in the long term (9 per district)	√		
Ownership and participation by DL users	√		
DL broadcasting station is physically accessible by users	√		
Broadcasting in local languages	√	√	√
Light and flexible management and high adaptability	√		
Flexibility in the broadcasting schedule (easy changes)	√		
Technical capacity (some)		√	√
Infrastructures in ASALs (some)	√		
Accessible from standard radio receivers	√	√	
Methodological capacity with DL (some)		√	

EfN requirements	CR	KBC	Satellite
Institutional integration		√	
Clear reception in otherwise unreachable locations			√
Local capacity building and close links with DEO	√		
Full integration following digital migration of radio (by 2020)	√	√	√
Digital broadcasting (at present)	√	√	√
Light costs of operation, maintenance, and repair	√		√
Scalable system	√		
Authority/status		√	
Little dependence on infrastructures			√

CR = Community Radio; KBC = Kenyan Broadcasting Corporation

Receivers

Off-the-shelf radio receivers are the easiest and cheapest option but have some disadvantages: the cheap models do not have playback functions or multiple powering options. Models with these features belong to a higher band, with many unneeded functions, more complex to use, and substantially more expensive. Such devices are also likely to be high-jacked by adults or other children to listen to programmes unrelated to education. An alternative option in the longer term would be a tailor-made device capable of both receiving FM and playing audio files from a small memory card such as those commonly used by digital cameras and mobile phones: an inexpensive card could store a whole subject-module (e.g. 30 audio units of 30 minutes each could be saved on a one dollar card of 256-500MB). Each audio unit would start with clear identifiers, with reference to a chronological programme list, and a summary of contents. Students could select an audio unit for playback by browsing the memory card in their device with a simple back-forward button and without the need of a display.

Table 4 compares standard radios devices (off the shelf), tailor-made devices, and non-networked devices (such as CD players and tape recorders). At present a tailor-made device best meets all the requirements.

Table 4. Requirements for educational radio receiving devices

EfN requirements from the device at the receiving end	SR	TMD	NND
Can be provided to each individual student (at a price of no more than 10 USD per unit)	√	√	
Can be used by a child	√	√	√
Easy to maintain or repair	√	√	√
Small and portable	√	√	√
Robust	√	√	
Powered in a cheap and reliable way		√	
Can receive the DL broadcast programmes (FM)	√	√	
Can store audio files		√	√
Allows to identify audio files for targeted play back		√	√
Can only be used for the DL programme (can not be appropriated for other uses)		√	

SR = standard radio; TMD = Tailor-made device; NND = non-networked device