

TERMS OF REFERENCE FOR A STUDY TO IMPROVE THE EFFICIENCY AND EFFECTIVENESS OF FERTILIZER USE IN RWANDA

The Government of Rwanda (REMA and MINAGRI) and the UNDP-UNEP supported Poverty-Environment Initiative Rwanda (PEI Rwanda) are seeking three consultants to carry out a study to improve the efficiency and effectiveness of fertilizer use in Rwanda to achieve food security and reduce poverty while maintaining ecological sustainability. (Annex 1 describes the PEI Rwanda programme).

Introduction

Rwanda is a small country with a total area of 26,338 sq. kms and a population of 11.7 million people in five provinces (Rwanda Census, 2012). The country has made great strides in socio-economic development since the 1994 genocide against the Tutsi which claimed more than one million lives. Currently Rwanda is at the forefront of the countries that are improving the social and economic wellbeing of its people, as enshrined in MDGs, the Economic Development and Poverty Reduction Strategy and the Vision 2020. It has set ambitious targets for 2015, 2018 and 2020 which are key to driving sector development agendas.

Key targets apply to the agriculture sector as the Rwandan economy is based mainly on agriculture. The sector occupies approximately 80% of the active population, especially women, and contributes approximately 36% of the GDP and about 70% of the country's export revenue. This is generated mainly through exports of coffee and tea (MINECOFIN 2007). Land resources are considered the most important factor of production, backbone of the economy and the basis of survival for almost all the entire population, generating about 90% of the food required in the country. However, due to the increase in the population there has been a reduction in the per capita availability of land. There has also been declining soil nutrient levels through erosion and over-cultivation, hence agricultural productivity has been declining significantly in recent years, which in turn reduces agricultural yields, raises the per unit cost of production and reduces rural incomes. Studies carried out by PEI Rwanda and others show that soil erosion and over-cultivation have contributed to a greater than 20 % decline in agricultural sector productivity in many districts. The situation provides an example of the links between environmental and natural resource sustainability and the achievement of development goals – in this case, poverty reduction and food security – is more difficult to achieve due to unsustainable agricultural practices.

Overview of Fertilizer use in Rwanda

The use of the inorganic fertilizers in Rwanda can be traced back to the early 1970s when the “Institut des Sciences Agronomiques du Rwanda (ISAR)” began to conduct fertilizer trials but there was no clear evidence of a national commitment to promoting widespread adoption of inorganic fertilizers at that time. This was due to Rwandan soils being considered generally fertile and it was believed that fertility could be maintained by using locally available organic fertilizers in combination with crop rotations and anti-erosion techniques. Additionally, inorganic fertilizers were expensive and required foreign exchange as they are imported. The emphasis was on self-sufficiency and organic approaches to soil fertility and agricultural productivity. By the late 1980s, however, there were documented signs of declining agricultural productivity and it is from here that the interest in the potential role of inorganic fertilizer began to grow.

Rwanda’s post-war agricultural policy has been strongly in favour of intensification using modern inputs and the transformation of Rwanda’s semi-subsistence producers into commercial farmers¹. From 1995 to 1998, the European Union supported Government with a fertilizer import programme where imports were sold to NGOs and private sector distributors who served as the relay to move inputs through farmers’ associations and then on to farmers. EU and the UN (mainly FAO) provided information support and assisted extension services to encourage the use of NPK (17,17,17), urea and DAP fertilizers in Rwanda. End distribution was a mix of aid (free or below cost distribution) by NGOs, cash sales, and barter trade (crops for fertilizer). The subsidy on EU fertilizer declined from 50% in 1995 to 20% in 1998. During this period, there was a gradual shift of fertilizer use from “17-17-17” to increase use of phosphate fertilizers (DAP and Urea). However, during this period fertilizer consumption remained low. The EU programme also experienced problems with unpaid input credit, forcing a reduction in the share of inputs distributed on credit in 1998 and a complete halt to credit sales in 1999. EU inputs stopped in 1998 but distribution of available stocks continued into 1999.

In late 1999 and early 2000, the Government made three policy decisions to support the growth of the private sector imports. A law was passed requiring MINAGRI approval for all free distribution of fertilizers so that private traders could compete with free or subsidized distribution by donors and NGOs. In May 2000, fertilizers were officially declared exempt from two taxes (OCHA-15% and entry – 5%) in an effort to lower retail prices and encourage uptake.

¹Kelly, V., Mpyisi, E., Murekezi, A., Neven, D. “Fertilizer Consumption in Rwanda”, 2001

In late 2000, the World Bank Agricultural and Rural Markets Development (ARMD) project provided a line of credit at subsidized interest rates to fertilizer importers.

Following food crisis of the mid-2000s, the Strategic Plan for Agricultural Transformation in Rwanda (MINAGRI 2004) was launched with at its core crop intensification, with supporting emphasis on soil erosion control and liberalisation of the fertilizer market among others. By 2005, fertilizer importation peaked at 7,249 tons, below the target of 63,000 tons, largely due to low demand by farmers. Following the review of the Economic Development and Poverty Reduction Strategy (EDPRS) 2008-2012 and overall performance of the agricultural sector, the Government launched the a revised policy “Strategic Plan for the Transformation of Agriculture in Rwanda - Phase II” (2009). Recognising that the agriculture had not significantly impacted on poverty reduction targets and that sector spending was insufficient to meet the needs, the revised Strategy has contributed towards strengthening achievements towards crop production increase through intensification. Public sector spending increased to a high of 7% in 2010/11 compared to a low of 3.5% in 2007. National average fertilizer use was raised from 6 kg/ha in 2006 to 30kg/ha in 2010 (MINECOFIN, 2011). The proportion of land protected from soil erosion was 87% in 2010/2011, up from 40% in 2006 (MINECOFIN, 2012). Today, the Government policy remains focused on intensification and strengthening commercial farming with inputs provided by the private sector and government providing policy direction and technical support through extension services. This has also included adopting an approach where commodity-based cooperatives undertake bulk purchases of inputs (e.g. fertilizers) with combined credit guarantees and extension services, as a means of addressing farmer constraints. The Ministry of Finance and Economic Planning issued Budget Call circular for 2015-2016 states that one of the five stated national priorities is “Agricultural productivity and agro-processing driven by the private sector including establishing a clear strategy of Horticulture”

The Rwanda Environment Management Authority (REMA) supports the national development priorities of the EDPRS I and II and acknowledges the orientations of national agricultural strategies towards national development efforts. However, it has raised concerns on the potential negative impacts from fertilizers on the environment, in particular fertilizer run-off affecting water resource quality and in turn potential threats to human health and biodiversity². REMA has been advocating for increased agriculture production and environmentally sustainable agricultural practices (e.g. agroforestry, climate resilient agriculture, terracing, maximise use of organic fertilisers) as a means of achieving agricultural sector targets³.

²REMA, “Impact of Fertilizer use in Rwanda – Rweru-Mugesera Wetland Complex”. Final Report prepared by Green World Consult Ltd., June 2014

³REMA in collaboration with MINECOFIN, Policy Brief No. 2 Agriculture and Development.Environmental mainstreaming in Rwanda, REMA, www.rema.gov.rw. [undated]

Similarly, MINAGRI favours an integrated nutrient management that enables adaptation of plant nutrition and soil fertility management in farming systems to site characteristics taking into advantage the combined and integrated use of organic, mineral and bio-fertilizers, and soil amendments (such as lime) to serve the complementary requirements of agricultural productivity, economic efficiency, environmental sustainability and social viability⁴.

Rationale for the Study:

The Ministry of Agriculture and the Rwanda Agriculture Board (RAB) have recognised the need to strengthen inorganic fertilizer policies in the context of current national development priorities and social, environmental and economic considerations, based on evidence and rigorous analysis. There is a general recognition that there is insufficient understanding of how to maximise agriculture sector benefit-cost ratios in Rwanda, including the most cost-effective mix of, for example, soil erosion control techniques, organic fertilizer, inorganic fertilizer and crops for different agro-ecological zones. Further, there is a need to maximise the economic effectiveness of inorganic fertiliser in terms of foreign exchange use, as it is imported.

It is recognised that a key issue inhibiting the determination of the most cost-effective use of fertilisers is the lack of on-farm data on fertilizer uptake by different crops in the Rwandan context (agro-ecological zones, soil types, relief, etc.), partially owing to the non-availability of up to date research on a number of key issues. These include soil acidity problems, declines in soil fertility, the past and current practices of combining inorganic fertilizers with organic fertilizers, and the implications of different agro-climatic zones for fertiliser use efficiencies. These issues need to be better understood by senior decision makers in Government (e.g. MINECOFIN, MINAGRI, and MINIRENA) and recognition made on the need to identify optimal fertilizer doses to maximise returns to farmers and cost-effectiveness from a national perspective, including in terms of foreign exchange. They also need to be understood to minimise environmental degradation – for example, to minimise the amount of fertiliser that is washed down hillsides into water bodies, which has environment impacts and is not used by plants.

Without cost-effective fertilizer use Rwanda will be faced with increasing economic costs, including foreign exchange costs. Without sustainable agriculture, including in terms of fertilizer use, Rwanda will be faced with decreasing agricultural productivity and higher fertilizer per hectare. It could also be faced with potential increasing environmental degradation with associated human health impacts and higher clean-up costs. At a farm

⁴ Plant nutrition for food security. FAO fertilizer and plant nutrition bulletin No. 16 p 348, Rome 2006, ISBN 92-5-105490-8

household level, more cost-effective fertilizer use will help increase food production and incomes thus helping to reduce poverty and EDPRSII objectives.

Study Purpose:

The overall purpose of this consultancy is to undertake a study to assist the GoR to improve the cost-effectiveness and ecological sustainability of inorganic fertilizer use from both the farm and national perspective.

Within the context of the overall purpose, the study will achieve the following objectives:

- 1) Estimate the production (ie technical) use efficiency of inorganic fertilizer using available data for crops, fertilizer use by type, and agro-ecological zones. In addition, provide recommendations for improving such analysis in the future.
- 2) Determine the benefit-cost ratio (BCR) of current inorganic fertilizer use from a farm and national perspective. Summarise the future economic and agricultural productivity implications of this based on current trends, policies and markets. Provide recommendations for improving such analysis in the future.
- 3) Identify institutional (agriculture sector institutions, policies, laws, strategies, programmes, capacity, decision-making processes including co-ordination mechanisms and methodologies, extension services, marketing, co-operatives, financial resourcing etc) opportunities and constraints to improving efficiency and effectiveness at national and farmer level. Assessment of effectiveness is to include economic, social (ie distributional) and environmental factors.
- 4) Identify and outline future research priorities on fertilizer use in the context of Rwandan national development priorities and agricultural strategies. This should include economic, social and environmental research elements of fertilizer use.

Issues and Tasks:

In order to achieve the stated objectives, the consulting company will examine the following issues:

- Compile an up to date overview of inorganic fertilizer use in Rwanda since 2004, including any trends in farm level use.
- Describe and analyse the state of knowledge in Rwanda on production use efficiency of fertilizers for the main crops, identify and document data gaps (including environmental variables). Recommend a detailed research programme for enabling such analysis to be undertaken in the future and to address identified gaps.

- Determine the benefit-cost ratio for main crops using existing data and making assumptions for missing data or establishing proxies, including fertilizer uptake and loss.
- Describe and analyse the distributional impacts (positive and negative) of current fertilizer policies and practices at farm level. In particular, describe and analyse the implications for household incomes and poverty reduction. Poverty should be interpreted in the multi-dimensional sense. E.g. increased farm household income may improve health status and school attendance.
- Identify current and future opportunities and constraints on improving fertilizer use effectiveness at national and farm decision-making levels. (This includes improvements to general agricultural practices (e.g. are conservation agriculture techniques used widely), the combination of organic and inorganic fertiliser used, adoption of agro-forestry, private sector engagement, and agriculture policy and extension strategies.
 - National level decision-making includes institutional factors (institutions, policies, laws, strategies, programmes, capacity, decision-making processes including co-ordination mechanisms and methodologies, extension services, marketing, co-operatives, financial resourcing etc)
 - Farm level decision-making includes choice of crops, livestock, agricultural practices, types and mix of fertilisers etc
- Describe and analyse policies and policy co-ordination mechanisms relevant to the use and importation of inorganic fertiliser and if necessary, recommend enhancements to improve policy consistency with cost-effective and ecologically sustainable fertiliser use, within the broader aim of achieving pro-poor sustainable agriculture outcomes.
- Assess capacity in the agriculture sector relevant to improving fertiliser use and broader agricultural physical and economic efficiencies. Include a substantive focus on agricultural extension services.
- Provide recommendations for strengthening the effectiveness of the use of inorganic fertilizers in Rwanda, in the context of broader agricultural practices, policies and national agricultural and EDPRS II priorities.

The recommendations should seek to:

- Maximise the crop nutrient uptake and economic efficiency of inorganic fertilizer use.

- Maintain or enhance soil nutrient levels using organic and inorganic fertilisers in the context of integrated small-holder agriculture methods to enhance agricultural productivity.
 - Minimise environment degradation, including from run-off or leaching into water resources.
 - Minimise potential negative human health impacts.
 - Improve institutional capacity for the implementation of the study recommendations through policy reforms, programmes, and research.
- Prepare a policy brief of no more than six pages designed to persuade relevant decision-makers in the agriculture sector, Financial sector, Environmental sector, Parliament, Cabinet and the donor community that the study recommendations should be implemented.

Methodology

Prospective consultants will propose relevant methodologies in their technical proposal to meet the technical requirements of the consultancy as per the objectives and outputs above.

In addition prospective consultants are guided by the following:

- The study will make maximum use of available data and approved methodologies, with minimum yet strategic additional data collection (e.g. surveys) . Models currently available that are likely to be useful are those developed and/or applied by IFPRI and FAO among others.
- The consultants will adopt a participatory approach during the information collection and data analysis process, particularly with key agricultural sector stakeholders.
- It may be necessary to use research findings from other countries, but as far as possible the study should use data and research from Rwanda.
- Document best practices in inorganic and organic fertilisers' application in Rwanda with lessons learnt and challenges met.
- Draft report to be presented at a validation workshop attended by members of the Study Advisory Committee and key stakeholders.
- Draft final report to be presented to the Study Advisory Committee for endorsement.
- The Final Report, policy briefing note and PowerPoint presentation will be presented at a high level work session targeting senior decision-makers from Government

(MINECOFIN, MINAGRI and its institutions, MINRENA), private sector stakeholders (Chamber of Commerce) and national civil society (e.g. Farmers Associations).

Deliverables and Timeline:

- Draft Inception report within 14 days (2 weeks) after the signature of the contract, to include
 - Comprehensive and detailed study methodology
 - Report outlines (chapters) for the entire consultancy
 - Summary of data availability and proposed data collection

- Final Inception Report after incorporating comments from the Study Advisory Committee submitted prior or during the validation workshop of the draft inception report.

- Complete draft report, not exceeding 40 pages excluding annexes, submitted 6 weeks after the endorsement of the Final Inception Report.

- Final report, not exceeding 40 pages excluding annexes, submitted no later than 2 weeks after receiving compiled comments from the PEI Rwanda Project Manager.

- A six page (A4) maximum Policy brief presenting key study findings and concisely and clearly articulated recommendations for any policy and programme reforms and any further research studies. The policy brief will be directed to senior policy makers.

- A PowerPoint file containing text, illustrations (e.g. graphs) and pictures presenting the key study findings and clearly articulated recommendations for any policy and programme reforms, and any further research studies.

Management and Reporting

The consultants from the consulting company will report contractually to the UNDP Rwanda country office, which is the contracting party on behalf the UNDP-UNEP Poverty Environment Initiative (PEI) Rwanda Programme. The PEI Rwanda programme is led by the Rwanda Environment Management Authority (REMA) of the Ministry of Environment and Natural Resources (MINRENA) in collaboration with the Ministry of Economy and Finance (MINECOFIN) and key sectors (including MINAGRIC). It receives financial and technical support from the PEI Africa Regional team based in Nairobi.

The PEI Rwanda programme manager, based in REMA, will provide day to day and overall management on behalf of REMA in close consultation with MINAGRI and the PEI Rwanda programme.

The Lead Technical Consultant will be responsible for the satisfactory submission of all study deliverables in accordance with the TORs, and will be responsible for directing the contributions of the National Fertilizer Expert, who will be co-author to the study report. The National Fertilizer Expert will be responsible for his/her inputs in agreement with the Lead Technical Consultant.

From a technical and substantive perspective the consultants will report to, and coordinate with, a Study Advisory Committee consisting of technical staff of MINAGRI, Rwanda Agricultural Board (RAB), REMA, UNDP-UNEP PEI Africa Regional Team, UNDP Rwanda and MINECOFIN. MINAGRI will chair the Study Advisory Committee. The consultants will submit all technical reports (inception, draft and final reports) for endorsement by the Study Advisory Committee. The members of the Study Advisory Committee will provide support to the Consultants to: 1) obtain key documents, 2) meet key decision-makers and stakeholders; and 3) provide guidance and direction to the consultants.

Required Qualifications of the Consultant Team

Lead Technical Consultant Agricultural Economist (estimated input of 40 days, of which 30 days in Rwanda)

- Master's degree or preferably PhD in agricultural economics,
- Minimum 10 years work experience in tropical agriculture, including policy, programmes and/or research.
- Experience with the application of benefit-cost analysis and relevant models required.
- Previous assignments in Rwanda or Africa related to determining the economic efficiency and effectiveness of agricultural inputs and practices, preferable including inorganic fertilisers.
- Experience in poverty and social impact analysis related to the agriculture sector, and/or natural resource management sectors would be an advantage;
- Excellent written and verbal communication skills, including the ability to express ideas clearly, concisely and effectively, both orally and in writing;
- Fluency in English is required, and proficiency in French would be an added advantage;

- Be willing to travel extensively in Rwanda's rural areas and districts.

National Fertilizer Expert: (Estimated input of 50 days in Rwanda)

- Master's degree in agronomy with specialisation in soil science;
- Minimum 7 years work experience in relevant agricultural fields (policy, programmes, and/or research), including the strategies and policies affecting agriculture sector development, extension services, agricultural inputs, and agricultural commodities and value chains;
- At least two previous assignments in Rwanda or the Region related to determine the economic and social efficiency and effectiveness of agricultural inputs towards improving production, preferably related to inorganic fertilisers.
- Experience in undertaking consultancy assignments or research in Rwanda related to the formulation, implementation and/or monitoring of agricultural sector policies and programmes.
- Excellent written and verbal communication skills, including the ability to express ideas clearly, concisely and effectively, both orally and in writing;
- Fluency in English and Kinyarwanda is required, and proficiency in French would be an added advantage;
- Be willing to travel extensively in Rwanda's rural areas and districts.

Environmentalist/

- Master's degree or preferably PhD in Environmental studies
- Experience (minimum 5 years) in environmental studies & impacts with specialization in the impact and the contamination on the fauna and the flora.
- Experience in the assessment of the ecosystems sensitivity due to contamination resulting from inorganic fertilizer.
- At least two previous assignments in Rwanda or the Region related to determine the economic and social efficiency and effectiveness of agricultural inputs towards improving production, preferably related to inorganic fertilisers.
- Experience in undertaking consultancy assignments or research in Rwanda related to the formulation, implementation and/or monitoring of agricultural sector policies and programmes.
- Excellent written and verbal communication skills, including the ability to express ideas clearly, concisely and effectively, both orally and in writing;

- Fluency in English and Kinyarwanda is required, and proficiency in French would be an added advantage;
- Be willing to travel extensively in Rwanda's rural areas and districts.

Duration of Assignment

The assignment will be for a total of 90 days for over a period of 4 months starting from the date the contract is signed until the final report is endorsed by the Study Advisory Committee and UNDP Rwanda.

Technical Evaluation Criteria-Fertilizer study

Summary of Technical Proposal Evaluation forms		Score weights	Points obtainable	Company/Other Entity				
				A	B	C	D	E
1	Expertise of the firm/Organization submitting the proposal Relevance of; <ul style="list-style-type: none"> • Experience on similar programme/projects especially dealing with Cost benefit analysis studies. • Experience on projects in the country/region as well as major multilateral/or bilateral programme 	15						
		10						
	Total	25						

Technical Proposal Evaluation Form 2		Points obtainable	Company/Other Entity				
			A	B	C	D	E
Proposed Methodology and work plan							
2.1	To what degree does the offeror understand the tasks?	20					
2.2	Proposed work plan <ul style="list-style-type: none"> • Is the presentation clear & is the sequence of activities & promise efficient implementation of the project? 	10					

2.3	Is the scope of task well defined & does it correspond to the ToR?	10						
	Total	40						

Personnel				Company/Other Entity				
Form 3				Company/Other Entity				
Agricultural Economist (Team Leader)			obtainable	A	B	C	D	E
Proposed work plan & Approach								
3.1	-Professional qualifications as specified in the ToR	3						
3.2	Minimum 10 years work experience in tropical agriculture, including policy, programmes and/or research	5						
3.3	Previous assignments in Rwanda or Africa related to determining the economic efficiency and effectiveness of agricultural inputs and practices, preferable including inorganic fertilizers characteristics	2						
3.4	Experience in poverty and social impact analysis related to the agriculture sector, and/or natural resource management sectors would be an advantage	2						
3.5	English written & oral communication skills,	2						
3.6	Knowledge of the regional and or/ Rwanda	1						
	Total	15						

Form 4				Company/Other Entity				
National Fertilizer Expert			obtainable	A	B	C	D	E

4.1	Professional qualifications as specified in the ToR		2							
4.2	Minimum 7 years work experience in relevant agricultural fields (policy, programmes, and/or research), including the strategies and policies affecting agriculture sector development, extension services, agricultural inputs, and agricultural commodities and value chains.		3							
4.3	At least two previous assignments in Rwanda or the Region related to determine the economic and social efficiency and effectiveness of agricultural inputs towards improving production, preferably related to inorganic Fertilizers		3							
4.4	Fluency in Kinyarwanda and English, and knowledge of French would be an added advantage		2							
Total			10							
					company					
Environmentalist					obtainable	A	B	C	D	E
5.1	University Graduate in the fields of, Environmental sciences and Management		2							
5.2	Minimum of 5 years' experience in research, policy formulation and programme		4							
5.3	Experience of at least two assignments of a similar nature		2							

5.4	Fluency in English, and knowledge of French would be an added advantage	1						
5.5	Knowledge of national policies (e.g. EDPRS), sectoral plans is a plus	1						
	Total	10						

Annex 1: PEI Rwanda

The Government of Rwanda (GoR) is implementing the Poverty and Environment Initiative (PEI) with support from the Poverty and Environment Initiative of the United Nations Development Programme (UNDP) and the United Nations Environmental Programme (UNEP). PEI's broad aim is to enhance the contribution of the sustainable management of natural resources (NR) to poverty reduction, food security and economic growth, and to facilitate the achievement of both the Rwanda Growth and Development Strategy (MGDS) and the Millennium Development Goals (MDGs).

The project overall goal is to contribute to poverty reduction and improved well-being of poor and vulnerable groups through mainstreaming of poverty-environment linkages into national development processes. The objectives of the Poverty and Environment Initiative are as follows:

- Inclusion of environmental sustainability as a central objective in national development strategies, such as poverty reduction strategy papers (PRSPs), MDG implementation plans or equivalent
- Increasing national budget allocations in support of pro-poor environmental outcomes
- Building the long-term capacity of the government to integrate poverty-environment concerns into the design and implementation of development plans.

The Poverty-Environment Initiative (PEI) provides support to mainstream environmentally sustainability natural resource management into national and sectorial development processes. Such mainstreaming will ensure that poverty reduction is not undermined by the unsustainable use of natural resources including soils and other ecosystems assets. The focus of PEI country programmes is thus on integrating environmentally sustainable natural resource use into national and sectorial development processes and budgets and on capacity building at the national and sectorial level. Rather, it is aimed at helping government to integrate sustainable natural resource management into national and sectorial development plans so that government ministries include and better fund such programmes, including from increased donor support. A priority for the PEI is to work with in-country donors to increase financial support for environmentally sustainable natural resource management.

Background information on the UNDP-UNEP PEI and the various aspects of the planning processes at country level can be found on the PEI website at <http://www.unpei.org>.