2.3 Action Plan for Agro forestry

2.3.1 Technology description

Agro forestry is the integration of agriculture and/or farming with forestry so the land can simultaneously be used for more than one purpose. This practice is meant to have both environmental and financial benefits. The presence of trees can provide benefits such as sheltering livestock from the elements and improving the soil so that crops will be more productive. The agro forestry system can also provide a more even income for landowners since all of their income is not tied to a few crops or a single season. Agro forestry can also make it easier for farmers to transition from one type of crop to another as market demand for their products changes.

Agro-forestry is used in almost the whole world where agriculture is practiced. In Rwanda, it is practiced in the agricultural zones which are found in all the provinces. Crops can be grown together at the same time, in rotation, or in separate plots when materials from one are used to benefit another. Agro-forestry systems take advantage of trees for many functions: to hold the soil; to increase fertility through nitrogen fixation, or through bringing minerals from deep in the soil and depositing them by leaf-fall; and to provide shade, construction materials, foods and fuel.

Although agro forestry requires more planning and know-how than simpler land uses given that the system must take into consideration the diverse and sometimes contradictory needs of each component, its environmental and adaptation benefits are many. They include: Increased water infiltration and slow runoff flow, stabilized and protected stream banks from erosion, filtration of pollutants from runoff water, provision of shades to streams for controlling temperature, provision of woody debris that promotes good stream habitat, provision of habitat for wildlife, provision of conduits for wildlife movement, slowing erosive winds and promotes dust deposition, provides visual diversity that improves scenic quality, screening undesirable views.

Socio economic benefits are mainly; creation of jobs in seedling preparation, land preparation, plantation, maintenance and harvesting; creation of investment in forestry production inputs, equipments and production transformation industry. It increases the income earned and inputs saved through improvements in the farm resource base and products for sale. Through increased yields, it provides significant savings for households on fire wood, forage and fertilizer purchase.

2.3.2 Targets for agro forestry

Agro forestry systems being suitable for all kind of farming practices, the target group for its transfer and diffusion is the entire Rwandan farming community. It is estimated that sub groups (farming communities made of households living in the same village, associations and cooperatives) of the 1 400 000 households involved in farming activities will benefit from the transfer and diffusion of agro forestry systems. Specific target would be that agro forestry be integrated on 210000 ha equivalent to 25% of the total arable land in Rwanda by 2020.

2.3.3 Barriers to agro forestry diffusion

Categories of identified barriers are: Political, economical, financial and technical.

Political barriers are mainly related to gaps that exist in forestry development legal framework. In fact the country has neither specific policy nor strategy on agro forestry development. Economic and financial barriers include relatively high initial investment, limited access to credit, high interest rate and the fact that agro forestry systems have no immediate economic benefits. Technical barriers are mainly those related to technical knowledge gaps which exist among agro extension agents and limited information and lack of awareness at farm level.

There also exists overall enabling framework which would assist in overcoming the identified barriers and meeting the specified targets and milestones for transfer and diffusion of agro forestry. They basically include already existing environment and other relevant factors to the transfer and diffusion of the technology. First of all, there exist institutions that intervene in the development of agriculture sector and agro forestry sub-sector. They mainly include the Ministry of Agriculture and Animal Resources and the Ministry of Natural Resources which has forestry development in its attributions. The mandate of these core institutions is policy, strategy development and evaluation among others, Rwanda Agriculture Board and Rwanda Natural Resources Authority / the forestry department which mostly deals with research, policy, strategy implementation in general and agro forestry technology transfer and diffusion in particular. Other institutions which directly partner with the above mentioned in the development of the agriculture sector are; The Ministry of Finance, The Ministry of Local Government, The Ministry of Trade, Rwanda Environmental Management Authority, Rwanda Cooperative Agency, Rwanda Governance Board, Rwanda Development Board, Rwanda Bureau of Standards, Financial Institutions and Research Institutions. Existing civil society partners include

NGOs, farmers' associations/cooperatives and local business people (manufacturers, wholesalers and retailers). Other proposed enabling environments include; tax exemptions, subsidies and incentives.

2.3.4 Proposed Action Plans for Agro forestry

Table 19: Detailed action plan for the transfer and diffusion of agro forestry

Objective	Activities	Legal and Institutions framework	Responsibility	Timeframe	Estimated cost (USD)	Source of funds	Success indicators	Risk indicators
Increase local expertise	1. Production of training materials	-National forestry policy -Agriculture sector transformation strategy-Phase II - MINAGRI -MINICOM -MINECOFIN -MINALOC -MININFRA -RAB -REMA	The Ministry of Local Governance for solving project site related issues, population mobilization and project implementation. the Ministry of Agriculture and the Ministry of Natural Resources for technical expertise and the Ministry of Finance for fund	1 year	50000	Funds are expected mainly from local funding institutions such as the Ministry of Finance and local banks. Other source of funds include the World Bank, the African Development Bank, FAO,	Training material are available	Poor content of the training material

		-RNRA	mobilization and allocation			IFAD and UNEP		
	2. Organize and conduct training sessions for agro extension agents			1 year	400000		One agro extension agent per sector is trained about the development and functions of integrated agro forestry systems	Absence of trained agro extension agents
	3. Provision of support to the rehabilitation of existing agro forestry research sites			2 years	150000		At least three existing agro forestry research sites are rehabilitated	None or not all existing agro forestry research sites are rehabilitated

Raise awareness	4. Production of awareness raising materials			1 year	50000		Awareness materials are produced	Non or incomplete awareness material are produced
	5. Installation of agro forestry demonstration sites			5 years	500000		Existence of at least one well developed agro forest demonstration site per province (5 country wide)	None or some of the proposed agro forestry demonstration sites are installed
	6. Organizing and directing farmers study tours			2 years	1000000		All farmers associations/cooperative leaders have at least visited one successful agro forestry site	None or very few farmers study tour are conducted

Reduce initial investment	7. Creation of tree seed stands in every district			5 years	2000000		Existence of one tree seed stands in every district	None of very few seeds stands are created
	8. Production of seedlings			4 years	1000000		Existence of one agro forestry nursery per sector in rural areas	Nurseries for agro forestry trees do not exist in all rural sectors

The interconnectedness of the components for seed and grain storage transfer and diffusion can be seen from activities dedicated to capacity building such as organizing and directing training sessions for agro extension agents, organizing and directing farmers study tours for better understanding and reception up to activities on actual transfer Production of training materials like the creation of tree seed stands in every district and production of seedlings. In fact, it was seen more relevant to start from informing the people before any other activity is undertaken.