Sector	Agriculture
Sub-sector	Crop production
Technology name	Application of water saving technologies, such as drop or sprinkler irrigation
Option name	Sprinkler irrigation
Scale	Large-scale
Availability	Available
Technology to be included in prioritization?	Yes

Background/notes

Systems of pressurized irrigation, sprinkler or drip, can improve water efficiency and contribute substantially to improved food production. Sprinkler irrigation is a type of pressurized irrigation that consists of applying water to the soil surface using mechanical and hydraulic devices that simulate natural rainfall. These devices replenish the water consumed by crops or provide water required for softening the soil to make it workable for agricultural activities. The goal of irrigation is to supply each plant with just the right amount of water it needs. Sprinkler irrigation is a method by which water is distributed from overhead by high-pressure sprinklers, sprays or guns mounted on risers or moving platforms.

Advantages of the technology:

One of the main advantages of the sprinkler irrigation technology is more efficient use of water for irrigation in agriculture. Sprinkler systems eliminate water conveyance channels, thereby reducing water loss. Water is also distributed more evenly across crops helping to avoid wastage. The sprinkler irrigation system has also been shown to increase crop yields and is suited for most row, field and tree crops that are grown closely together, such as cereals, pulses, wheat, sugarcane, groundnut, cotton, vegetables, fruits, flowers, spices and condiments and for cultivating paddy crop.

Sprinkler irrigation technology is well adapted to a range of topographies and is suitable for all types of soil, except heavy clay. Sprinkler systems can be installed as either permanent or mobile fixtures. Sprinklers provide a more even application of water to agricultural land, promoting steady crop growth. Likewise, soluble fertilizers can be channeled through the system for easy and even application. The risk of soil erosion can be reduced because the sprinkler system limits soil disturbance, which can occur when using irrigation by gravity. In addition, sprinkler irrigation can provide additional protection for plants against freezing at low temperatures. Secondary benefits from improved crop productivity include income generation, employment opportunities and food security.

Disadvantages of the technology*:*

The main disadvantages associated with sprinkler systems are related to climatic conditions, water resources and cost. Even moderate winds can seriously reduce the effectiveness of sprinkler systems by altering the distribution pattern of the water droplets. Likewise, when operating under high temperatures, water can evaporate at a fast rate reducing the effectiveness of the irrigation. Although sprinkler irrigation can help farmers use water resources more efficiently, this technology relies on a clean source of water and, therefore, may not be suited to areas where rainfall is becoming less predictable. Implementation costs are higher than that of gravity-fed irrigation systems and large labor force is needed to move pipes and sprinklers in a non-permanent system. In some places such labor may not be available or may be costly. Mechanized sprinkler irrigation systems have a relatively high energy demand.

Implementation assumptions (How the technology will be implemented and diffused across the subsector)	Such technology will be applied at agricultural lands with irrigation water scarcity, as well as areas with potential risks of droughts and high temperatures.
Impact statements (How the options impact countries development priorities)	
Countries social development priorities	• Contributes to food security priority by increasing productivity • Leads to increase in income of rural population

	• Reduces migration to urban areas from rural communities
Countries economic development priorities	• Contributes to diversification of economic activities priority of the country • Leads to improvement of economic condition of rural population • Leads to efficient use of resources such as land, water and fertilizers
Countries environmental development priorities	• Reduces use of irrigation water • Reduces amount of applied fertilizers to agricultural lands • Increases land fertility
Other considerations and priorities such as market potential	• Agricultural production will increase leading to decrease in the dependence of imported agricultural products at local markets
Costs	
Capital costs over 10 years	The cost of a drip irrigation system ranges from 1000 USD to 3500 USD per hectare depending on the specific type of technology, automatic devices, and materials used as well as the amount of labor required. As most cultivated lands are suitable for the application of sprinkler irrigation (approximately 1.6 million ha of cultivated lands), huge investment will be needed (up to 4 billion USD). Financing for equipment may be available from financial institutions via leasing operations or direct credit.
Operational & maintenance costs over 10 years	Operational cost for technology will be around 50-100 USD per hectare per year.
Other costs over 10 years	Additional costs will be needed to provide necessary capacity building activities for local farmers.