

5. Recommendations:

5.1 The Dynamic of Technology Production, Transfer and Commercialisation:

By applying the ARRED scheme, the dynamic of the technology production, transfer and commercialisation has to be secured. The technology production, transfer and commercialisation involves three separate phases:

- I. Opportunity recognition
- II. Technology design and generation
- III. Delivery and adoption

I. Opportunity Recognition:

In this first phase, a need or opportunity for implementation of new solar drying technology is identified.

A need/ opportunity for implementation of new solar drying technology may be recognised and articulated by the end-user – a *demand-pull situation*. Alternatively, a perceived need /opportunity for the solar dryer technology may be articulated and evaluated by the AREED and entrepreneur/producer at large. In this latter case, drying technology may first be generated, and suitable end-users may subsequently be searched for.

Factors that should be considered:

- a) Enhance awareness about the state of the drying technology – in-use vis à vis the state of art (processing art)
- b) Facilitate the flow of information between the promoter / producer and the end-user
- c) Create pressures for change and innovation tend to improve opportunity recognition

These factors are intrinsic to the end –user, the producer and AREED. Organisational and institutional factors that improve communication between the producer/ entrepreneur, the end- user and AREED can also facilitate opportunity recognition.

Competitive market forces, environment regulation or compelling societal needs are examples of exogenous pressures that may stimulate active pursue of new technologies and improve opportunity recognition.

I. Solar drying Technology Design, Suitability and Generation

In some regions, the identified solar drying technology opportunities are not equally important. The significance of any solar drying opportunity identified is in effect determined by the implied degree of technical advancement and socio economic impact. The potential impact depends on such factors as:

- Food security
- Employment
- Foreign exchange earning capacity
- And growth of GDP

These factors typically determine the importance of any identified for technical advancement. Non-economic factors, such as the political clout of the end-user, may also impact the importance attached to the identified drying technology opportunity. The second phase is complete when the new drying technology has been produced and is ready for delivery to the end-user.

II. Delivery and Adoption of the Solar Drying Technology:

The delivery of the solar dryer involves also its adoption by the end user. The importance of this new drying technology to the end-user's requirements is an important determining factor of adoption. For example farmers of rural areas, are tired of hearing about new technologies, which is often too expensive or they do not address their problems. Compatibility of the new drying with existing local environment, public and private infrastructure, culture and supporting institutions reduce the possibility of bottlenecks during the implementations and hence it increases the adoption's potential.

5.2 The Appropriate Product for Commercialisation:

It is not as simple as it looks, when it comes to take a professional evaluation to choose which of the product should be commercialised. Her, I will base my decision according to my experience gained from my earlier assignment and living in Africa. The commercialisation of the solar dryer or the dried agricultural products, I will rather recommend that the commercialisation of both products is needed.

There is a potential marked for small low cost drier in rural area. This will have clear impact on the under privileged community.

Giving an estimated number of how many units are required per month, requires a field marked- visit/ study. It is a bit earlier to determine, because of my limited knowledge of the five countries. I will rather base my evaluation on Uganda. In Uganda, it will be approximate 15 to 25 low cost dryer per month to satisfy the regional demand.

Commercialisation of the processed agricultural product is also related to the number of the sold solar dryers.

With regard to the investment on big solar dryers, such as the types for tobacco and timber, I will recommend the investments in a limited number. There is demand for both products by national and export market.

The deluxe solar dryer PV-powered can be commercialised only for entrepreneurs willing to start up the business of fruit and vegetables drying for the export marked, and where high quality of the product is required.

The production capacity according to the demand in Uganda will be approximate 5 to 10 per month.

5.3 The Marketing

The product marketing in rural area is always a missing link in Africa.

The marketing of specific product requires a good marketing strategy, that takes in consideration the tradition in the country and the possible ways of adoption.

<i>A successful marketing is to deliver the right product, at the right time, at the right price to the right people.</i>

In developed nations, marketing is dictated by rules and regulations based on conduct, competition, information and quality. Very few, if any of these rules are known in African remote areas. The agricultural processing/output marketing system is the primary mechanism for coordinating and guiding production, assembly, processing, storage, and consumption activities in the commodity chain.

5.4 Evaluation Tool

This is a suggestion to quick evaluation tool. The tool gives a quick overview of the requirement and the suitability of the specific technology, the end-users, the consumers of the dried products and the availability of the market.

		APPLIED DRYING TECHNOLOGY				PROCESSING TECHNOLOGY END -USERS			MARKET FOR THE DRIED AGRI - PRODUCT			INVESTMENT	
		Low cost dryer	Firewood drying	AC-powered Dryer	PV-powered dryer	Small scale farmers	Medium size farmers/ Cooperatives	Enterprises/ trader	Export	Local	Cross market	Dried products	Solar dryers
AGRICULTURAL PRODUCTS	FRUITS	Mangoes	☒		☒	☒			☒	☒	☒		
		Bananas	☒		☒	☒			☒	☒	☒		
		Oranges	☒		☒	☒			☒	☒	☒		
		Limes	☒		☒	☒			☒	☒	☒		
		Grapes	☒		☒	☒			☒	☒	☒		
		Apricots	☒		☒	☒			☒	☒	☒		
		Figs	☒		☒	☒			☒	☒	☒		
		Pineapples	☒		☒				☒	☒	☒		
		Apples	☒		☒	☒			☒	☒	☒		
		Almonds	☒		☒	☒			☒	☒	☒		
	Plumbs	☒		☒	☒			☒	☒	☒			
	VEGETABLES	Tomatoes	☒		☒	☒			☒	☒	☒		
		Cabbages	☒		☒	☒			☒	☒	☒		
		Onions	☒		☒	☒			☒	☒	☒		
		Peppers	☒		☒	☒			☒	☒	☒		
		Potatoes	☒		☒				☒	☒	☒		
		Broccolis	☒		☒	☒			☒	☒	☒		
		Squash	☒		☒	☒			☒	☒	☒		
		Asparagus	☒		☒	☒			☒	☒	☒		
		Celeries	☒		☒	☒			☒	☒	☒		
		Ginger	☒		☒	☒			☒	☒	☒		
		Garlic	☒		☒	☒			☒	☒	☒		
		Other herbs	☒		☒	☒			☒	☒	☒		
		FOOD CROPS	Cassava	☒		☒					☒	☒	
	Maize		☒		☒	☒				☒	☒		
	Beans		☒		☒	☒				☒	☒		
	Sweet potatoes		☒		☒	☒				☒	☒		
	Cowpeas		☒		☒	☒				☒	☒		
	Millet		☒		☒	☒				☒	☒		
	Sorghum		☒		☒	☒				☒	☒		
	Sesame		☒		☒	☒				☒	☒		
	Groundnuts		☒		☒					☒	☒		
	Beans		☒		☒	☒				☒	☒		
	Cash crops	Coffee	☒		☒	☒			☒	☒	☒		
		Cotton	☒		☒	☒			☒	☒	☒		
		Sugar canes	☒		☒	☒			☒	☒	☒		
		Tobaccos	☒	☒	☒	☒			☒	☒	☒		

	Meat	Fish	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
		Meat	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	Wood	Timber		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
		Other type		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
									<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
ENTREPRENEURS	One man production unit		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	Order production		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	Whole sale		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	Other types		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Applied drying Technology	Low cost dryer						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	Firewood dryer							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	Ac-powered dryer							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	PV-powered dryer							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Table7. Evaluation tool