

CHANGING WITH THE CLIMATE

Climate resilient industry

Since climate change was recognized as a problem in the late 1980s, the major focus has been on mitigation (that is, reducing atmospheric greenhouse gas emissions). But as it becomes clearer that even with mitigation, climate change is inevitable, there is increasing need for adaptation, or adapting to the conditions of the changed climate. Furthermore, there could be significant synergy between adaptation and the management of existing problems.

To date, climate change projects for industry have tended to favor low carbon (mitigation) approaches. For industry, mitigation is often adopted for cost-cutting benefits, through greater energy and resource efficiency. Manufacturers are less likely to prioritize adaptation and climate resilience because the benefits are not so visible.

Awareness of adaptation approaches also remains low. This is the case in Africa, where although the adverse impacts of climate change are recognized, the concept of adaptation is under-recognized. For industries in developing countries, the need to adapt to climate change is more urgent, as they are more vulnerable than developed countries. Greater awareness of adaptation is required for industry, particularly in Africa.

Vulnerability and value chains

In order to raise awareness and demonstrate benefits, UNIDO projects help governments roll out nation-wide implementation of low carbon and climate resilient industrial development. With the Low Carbon and Climate Resilient Industrial Development (LCCR) project, funded by the government of Japan, UNIDO is applying Green Industry policy instruments and Resource Efficient and Cleaner Production (RECP) techniques in four African countries. The project involves assessing national policy towards climate change and the vulnerability of the industry value chain, and identifying the need for intervention and appropriate technologies to address vulnerability at industry and/or factory level. This approach is expected to foster awareness and demonstrate the opportunities and benefits of enhanced climate resilience and low carbon growth in the productive industries.

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LCCR projects involve assessing the vulnerability of value chains in industries such as fruit and vegetable processing

Risks and resilience

For the agricultural industry in developing countries, the impacts of climate change are not only felt in primary production, but also in post-harvest processes, such as transportation and storage. When designing approaches to adaptation and mitigation, sector-wide needs must be considered.

The LCCR project engages a wide range of stakeholders to assess the impacts of climate change on the value chains of selected industries in Egypt, Kenya, Senegal and South Africa. For each country, impacts at the national level for key resources and locations were identified. After that, vulnerability was assessed in two selected sub-industries in each country through value chain analysis. Results to date have shown where interventions for adaptation are needed most for manufacturing and related production industries.

The assessment of Egypt's fruit juice industrial value chain found resilience could be enhanced through improved harvesting, as well as better storage and transport. Ways for harvesting practices to increase resilience at the farm level include improved extension and climate-smart farming techniques, while post-harvest resilience would be achieved by improved storage facilities, more efficient cold transportation and value-added post-harvest production.

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Value chain	Identified vulnerable processing steps	Risks				Possible adaptation technology
		Heavy rain	Flood	Drought	Temperature rise	
Growing & collection						
Transportation						
Sorting						
(Pre-process) Storage						
Washing						
Preparation						
Evaporation						
Dilution and sugar addition						
Pasteurization						
Packing						
Sterilization						
Storage						
Distribution						
	Storage (pre-process)	3	0	0	3	Refrigeration cycle upgrade
	Evaporation	0	0	3	2	Integrated Water Management
	Dilution and sugar addition	0	0	3	2	
	Pasteurization	0	0	3	3	
	Sterilization	0	0	3	3	
	Distribution	1	3	0	3	Refrigeration cycle upgrade

Table 1: Vulnerability matrix of fruit juice industry in Egypt

Drought is by far the most significant threat to the fruit juice industry, affecting five production processes: washing, sterilization, evaporation, dilution and sugar addition, and pasteurization (see Vulnerability matrix, Table 1). As such, an industry adaptation plan is needed to reduce the risk posed by such a disaster.

factories. By showing co-benefits from both adaptation and mitigation (such as in Table 2), including the protection of the health and safety of workers, UNIDO aims to draw attention to industry’s needs for climate resilience.



Drafting a vulnerability matrix during the workshop in Egypt

Adaptation technology	Potential mitigation co-benefit
Process upgrade for improved material efficiency & product yield e.g. Refrigeration cycle upgrade for improved cold chain and process cooling	<ul style="list-style-type: none"> • Reduced energy consumption • Reduced waste • Lower GWP of refrigerant(s) • Reduced leakage • Improved process control and product yield
Integrated water management <ul style="list-style-type: none"> • Water saving, cascade, recycle • Wastewater treatment 	<ul style="list-style-type: none"> • Reduced energy consumption • Energetic methane utilization
Solid waste management <ul style="list-style-type: none"> • Reuse and recycling • Landfill upgrade 	<ul style="list-style-type: none"> • Reduced raw material consumption • Energetic methane utilization

Table 2: Examples of adaptation technologies

Acclimating to climate change

The LCCR project is trying to identify and demonstrate the best approaches for climate resilience at pilot

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