



Circulair Economy Vietnam

Agriculture & (Re)use of resources

Commissioned by the Ministry of Foreign Affairs

Challenges

1. Overall agricultural productivity in Vietnam is relatively low

Agricultural growth has involved an increase in cropping areas or more intensive use of inputs (fertilizers, chemicals) and natural resources (water, land). But the country lags behind regional peers and has seen its declines in total factor productivity recently. At the same time, the sector faces domestic competition from other sectors (industry, services, urban development) for the use of labour, land and water. This negatively influences farmers' income and hinders the potential of economic growth.

2. Pesticides, herbicides and fertilizer are excessively used

Due to small-scale production of smallholder farmers, lower yields or a failed harvest can be catastrophic for the farmer. In recent years, Therefore, inputs are often used excessively. The smallholder farmers lack the capital to invest in efficient technologies to reduce the use of these inputs. This negatively influences farmer income, limits the options to reduce poverty in rural areas and increases the pollution of land and water.

3. Food safety is a concern for Vietnamese consumers

Because the agricultural sector is dominated by smallholder farmers, technological innovation has been limited. The produce often flows through traditional & informal markets causing that traceability is negligible. This has caused unreliable food quality & food safety, negatively impacting health & well-being.



4. The Vietnam agricultural sector is disproportionately affected by climate change

The agricultural sector has already been impacted by climate change, Forecasts show that the sector can expect to continue to be affected by temperature- and sea-level rise, disruption of rainfall patterns, and the intensification of weather extremes. Some of the impacts of climate change that affects the agricultural sector are droughts and salinization. E.g. the Mekong delta is losing fertile land annually due to salinization. This reduces production capacity and increases the need for climate action.

5. Water quality and availability causes problems for the agricultural sector

Irrigation has been critical in offsetting water shortages during the dry season and for protecting flood-prone areas during the wet season. Vietnam is subject to both periods of drought and flooding. While irrigation coverage is high, with most amenable areas equipped, the current irrigation systems were designed primarily for rice and several factors impede increases in water productivity. Existing irrigation schemes cannot provide the level of irrigation and drainage services that farmers need to intensify rice production or diversify crops away from rice. Incomplete structures and water losses during operations have many schemes operating at low capacity and there have been problems in managing water quality, especially in relation to the polluting effects of fertilizer and agro-chemical run-off. This influences both the availability of clean water to rural communities and the opportunity for economic growth.

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6. Expansion of the agricultural sector has led to deforestation and soil degradation

Multiple forms of environmental degradation have been associated with the expansion of Vietnamese agriculture. Vietnam is among the top five exporters in the world for coffee, tea, cashew, black pepper, rubber and cassava (World Bank, 2016), but this has its downside as well. The expansion of coffee production in the Central Highlands has been an important contributor to deforestation, biodiversity loss, and groundwater depletion.

Vietnam has developed into a top exporter of aquaculture products (especially shrimp production & pangasius). But, the expansion of shrimp aquaculture in the Mekong Delta has resulted in large-scale destruction of mangroves and has also been a major source of water pollution. Effluent from these ponds (which also contain large amounts of organic wastes) contaminate surrounding freshwater and coastal waters.

Opportunities for circular practices

The Strategic Partnership Arrangement on Agriculture and Food Security signed in 2014, by Vietnam and The Netherlands, works as an overarching umbrella structure for all existing and new areas of cooperation in agriculture and food security in the broadest sense. The following opportunities related to the (re)use of resources in agriculture were identified that have the potential to enhance the circularity of the sector and to contribute to the SDGs currently at stake:

1. Consultancy services on sustainable agriculture, resource mapping and circular strategies

The Netherlands is one of the world's largest exporters of agricultural and food products, thanks to its innovative agrifood technology. The Dutch agrifood sector is a sustainable source of healthy, safe food that is produced with respect for nature and the environment. In Vietnam the awareness and knowledge on technological innovations that can improve agricultural practices is growing. There is a potential for providers of consultancy services both in terms of mapping of resources for circular business models and in terms of implementing circular strategies.

2. Local production of organic fertilizer

Chemical or synthetic based fertilizer application is widespread. However, Human, animal and environmental health concerns are currently driving growth for organic fertilizer. Currently, the market

for organic fertilizer in Vietnam is valued at \$930 million but is expected to grow to \$1,5 billion by 2022. The growing market provides business opportunities for players in the organic fertilizer business. Sources for organic fertilizer can be found locally in Vietnam in waste streams of agricultural residues.

3. Biomass to energy from agricultural waste streams

Vietnam has access to vast amounts of agricultural residues. Biomass waste streams can be used for several purposes such as biomass combustion or gasification. E.g. Heineken brewery (Hanoi) uses its agricultural waste streams as feedstock for anaerobic digestion, which is used for heat generation that is used in the brewery. Another opportunity is rice husk. Vietnam produces 23 million tons of rice straw and 8-9 million tons of rice husk yearly. Only half of rice husk is used for domestic cooking, for ceramic/brick kilns or returned to the field as fertilizer, and recently, used in few rice husk-fired plants in Mekong Delta. NeoFin (NL based) is interest in forming a consortium for commercial use the rice husk, which causes pollution in Asia Pacific region, including Vietnam (for example to use rice husk for renewable energy or for production of SiO₂ to be used as additives in other industries).

4. Captive business models in biomass to energy

Vietnam has vast amounts of agricultural waste streams that could potentially be used as a means of producing renewable energy. From the current characteristics of the Vietnamese electricity sector, generating power for the national grid will probably not generate business interest. However, there is a potential for generating renewable energy for a single commercial off-taker. As the current energy market hurdles the development of private sector electricity sales to the grid, a captive model where the producing company sells all energy produced to one off-taker (that might be willing to pay more than the cost of electricity from the national grid on the basis of sustainability) might show to be feasible.

More info about the business opportunities regarding a circular economy in Vietnam can be found in the report 'Scoping Study Circular Economy Vietnam', May 2018, CREM and Partners for Innovation, commissioned by the ministry of Foreign Affairs; available through RVO.nl