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## **Good practices in bio-based circular economy in Vietnam**

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Circular economy is raising interest all over the world. In a bio-based circular economy, material and nutrient flows form loops. The article presents selected Vietnamese good practices in bio-based circular economy.

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## **A brief overview of bio-based circular economy**

Limited natural resources and climate change are driving us towards new economic and ecological solutions. Circular economy offers one answer to these challenges. In the current linear economy, natural resources are transformed into products and then dumped into the environment after being used. In a circular economy, however, material flows form loops: material is recycled for other purposes after usage. (EMF 2013)

The circular economy consists of biological and technical flows (EMF 2017). The bio-based circular economy concentrates on material in biological cycles, i.e. the circular use of bio-based resources e.g. bio-waste, wood products, wastewater sludge and agricultural residues.

Recently, circular economy has been adopted in international and national policies, showing that these nations are moving from rhetoric to action. In 2015, the European Commission (2015) released the Circular Economy Package, an action plan concerning the EU's transition towards a Circular Economy. In addition, China and France have laws concerning circular economy (Balkau 2017). Nevertheless, in addition to strategies on national level, concrete actions are also necessary. In fact, in quite many cases, this is where the development begins.

The country discussed in this article, Vietnam, is at a stage where circular economy is not yet in strategic focus. However, local circular economy actions are still emerging.

## **Current state of the Vietnamese bio-based circular economy**

During the 20<sup>th</sup> century, the concept of closing the nutrient loops was implemented to some extent in Vietnam. In the agricultural sector, waste from one activity was used as input for another activity. However, due to rapid economic development, the use of chemicals has rapidly replaced the more sustainable but less profitable nutrient-loop model. This came with a heavy price to the environment. (Renewable matter 2017)

Currently, approximately 28 million tons of waste is annually released into the

Vietnam environment, 46% of which comes from municipal sources (Schneider et al. 2017). It is interesting to note that 60-70% of the municipal solid wastes is bio-waste, which can be biologically recycled, e.g. turned into compost and/or biogas (Tran et al. 2014). However, the majority of solid waste in Vietnam is either burned or landfilled. For example, 76% of household waste in Vietnam's biggest city – Ho Chi Minh City – is buried in landfill sites (Báo Mới 2017). This gap between potential and reality of recycling can be seen as potential in the development of a bio-based circular economy in Vietnam.

According to Báo Mới (2017), there has already been a project to categorize household wastes at source in six districts of Ho Chi Minh City, reaching 20-30% categorization rate. Nonetheless, the impact of this project is questionable, as there is insufficient processing technology and infrastructure in the city. The categorized wastes are just grouped back together after being transported to existing waste facilities. Should this project be applied more successfully on a larger scale, a significant amount of waste would be turned into useful materials (Tran et al. 2014).

The recycling industry in Vietnam is undeveloped and very fragmented. In this industry, there is an interesting line of work where people roam around landfill sites to collect recyclable materials and sell back to recycler for a living. This job is called “ve chai” in Vietnamese. However, this way of recycling is extremely inefficient, and “ve chai” collectors barely make a living. (Vietnam Online 2015)

## **Notable good practices in Vietnam**

### **Biogas in Huế**

From 2011 to 2014, BAJ – a Japanese non-profit organization – funded to install 37 biogas digesters in rural areas of Hue city (Bridge Asia Japan 2011; Bridge Asia japan 2014). Those digesters turn livestock manure into biogas, which was initially used for cooking and in-home lighting. These biogas systems have saved approximately 250 USD per month in cooking/lighting costs for each participating family. This amount is significant as Vietnamese GDP per capita is only around 2200 USD/year. The digesters have also led to the development of a street-lighting system utilizing excess biogas produced at night. Excess gas would have been wastefully released otherwise. These systems have made the previously unlit streets much safer for local people. (Khoahoc.tv 2013; Thuy Xuan ward's People's Committee 2014).

## **Bio-fertilizer in Đà Nẵng**

A Japan International Co-operation Agency has provided 500,000 USD of funding to setup a biomass liquid fertilizer factory in Đà Nẵng city. This factory applies the organic waste circulation system developed in Chikujō (Japan) to turn municipal wastes into liquid fertilizer for agriculture activities. By 2016, initial testing facilities capable of processing 3.5 tons of waste a day have been operational. This new fertilizer reportedly helps crops to grow healthier. Excess use of the fertilizer does not result in chemical residuals in plants and land like other current chemical fertilizers. Furthermore, the price is roughly 10% that of their chemical counterparts, which greatly helps farmers, since they previously spent 10-20% of their revenue on fertilizers. (Vietnam News 2015)

## **Solid waste recycling in Đà Nẵng**

In 2015, Đà Nẵng's department of natural resources and environment, together with Vietnam Environment Corporation, introduced the first phase of the Khánh Sơn solid waste processing composite. The investment totals 40 million USD, resulting in a composite that can categorize and process 200 tons of household solid wastes a day. Wastes are turned into oil (industrial fuel), bio-char (soil-fertility supplement), and bricks (building materials). The facilities have achieved up to 0% solid landfill waste ratio. Its introduction has greatly reduced the burden on Khánh Sơn landfill site, which is imminently overloaded and is scheduled to close in 2020. (Tuổi Trẻ Online 2015)

## **Conclusions**

The development of a circular economy in Vietnam is still in its infancy, both in terms of awareness, technology and infrastructure. There are few policies and investments backing this concept. The majority of financial and technological support comes from international environmental organization in the region, especially from Japan. There is, however, great potential in the management of municipal solid wastes. The majority of those wastes can be biologically recycled into valuable materials. Last but not least, although sporadic and limited in scope, there are a number of bio-based circular activities that hint at a promising future for Vietnam.

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← *ADHD-lasten vanhempien kohtaaminen päiväkodissa*

## Vastaa

Sähköpostiosoitettasi ei julkaista. Pakolliset kentät on merkitty \*

Kommentti

Nimi \*

Sähköpostiosoite