



7th INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION Academic

“CLEANER PRODUCTION FOR ACHIEVING SUSTAINABLE DEVELOPMENT GOALS”

Cleaner production to adapt to climate change: A stakeholder Delphi survey in a heavily affected district in Vietnam

HENS, L.^{a*}, NGUYEN, A.T.^b, SAGASTUME, A.^c, CABELLO, J.J.^c, BLOCK, C.^d, VANDECASTEELE, C.^e

a. *Vito, Mol, Belgium*

b. *Hanoi University of Natural Resources and Environment, Vietnam*

c. *Universidad de la Costa, Barranquilla, Colombia*

d. *2C Ecosolutions, Oud-Heverlee, Belgium*

e. *KU Leuven, Department of Chemical Engineering, Heverlee, Belgium*

*Hens, L., luchens51@gmail.com

Abstract

As compared to mitigation of climate change, adaptation is often the poor cousin. Nevertheless the combination of the increasing reality of climate change effects and the inertia of the international community to reduce the greenhouse gas emissions makes adaptation (in combination with mitigation) increasingly important. Adaptation measures and actions are indicated in each sector affected by climate change impact. Most obvious they gradually appear managing:

- Biodiversity,
- Agriculture and forestry,
- Green and smart cities,
- Water security,
- Tourism,
- Extreme climate conditions and disasters.

The challenges raised in each of these domains differ, which results in a wide variety of actions, replies and responses: from nature-based solutions, over green roofs and bio-economies, to region tailored policies. This contribution analyses the diversified role of cleaner production in a context of adaptation to climate change related hazards in middle-Vietnam. Ky Anh is a district which is heavily and increasingly affected by recurrent storms. The adaptation capacity of the 20 coastal villages of the district is analyzed using a two rounds Delphi approach involving 36 panel members, representing the four major stakeholder groups in the area (authorities, farmers, fishermen, fish traders). They were invited to complete a questionnaire covering pressures, state, and responses of the local climate change associated events.

The replies to the adaptation part of the questionnaire revealed that after the main storms the measures by the local authorities, including construction policies, upgrading of dykes and irrigation systems, and the provided post-disaster assistance, were qualified as inadequate. The panelists suggested acting on:

- Planting larger areas of mangroves and other coastal protection forest.
- More investment in waste management.
- More investment in renewable energy (wind, solar, biomass).

Acting on “cleaner production” is an effective concept increasing the environmental, economic, social and health sustainability of the most necessary actions in these heavily affected regions.

Keywords: climate change, adaptation, Delphi