

## Climate Change as a Scapegoat: Assessing and Identifying Responses to Declining Yield of Sedge (*Cyperus Tegetiformis*) in Nga Son District, Thanh Hoa province, North Central Vietnam

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The productivity of sedge in the coastal communes of Nga Son district is declining. Though climate change (CC) is an easy scapegoat in the present context, after an initial inventory this study did a broad assessment of the causes before identifying responses. The study team:

- (1) Assessed the inter-annual variation of the weather
- (2) The sedge yields by using secondary data;
- (3) Mapped the predicted changes in flooded areas following the B2 CC scenario for Vietnam using GIS tools;
- (4) Identified constraints of sedge production through a survey and Focus Group Discussions (FGDs) and other Participatory Rural Appraisal (PRA) tools. After an inventory, the proposed solutions were ranked on feasibility for five criteria (see Table 1).

The weather assessment showed that from 1970 to 2013 the average temperature had risen to about 0.3°C, and the amount of rainfall decreased approximately by 20%. At present, about 114 ha is flooded annually between July and November. The flooded area is expected to increase to 4,072 ha by 2050 and 10,316 ha by 2100, accounting for 26% and 65%, respectively of the district's total land area.

Over the past years, the yield and length of sedge had declined; likewise, the market price has declined partly because of the reduced length. The constraints of sedge production include:

- (1) salt intrusion and fresh water shortage,
- (2) extreme climate events,
- (3) the applied dose of N (400 – 500 kg ha<sup>-1</sup>) is far more than the crop demand and
- (4) pests outbreak.

Three solutions to improve sedge yield and length were proposed. The top-ranking feasible solution was to improve the application techniques of fertilizer to increase N-use efficiency, as well as sedge yield and height. Other solutions which include improving irrigation system and finding new sedge varieties are less feasible due to financial and technical issues.

An on-station fertilizer experiment with lower N-application than that of the farmer's practice, but adding manure / organic matter (OM) improved the yield and quality of sedge. Amending Si might further enhance yields (Hanh et al 2016). Though climate change increases the problem of salinity intrusion, the main cause of reduced yield seemed to be related to excess N and low OM application.

**Table 1**

Feasibility ranking of the solutions to improve the yield and length of sedge.

Solution	Financial capacity	Technical capacity	Management capacity	Labour capacity	Expected efficiency
Improve application techniques of fertilizer	1	1	1	2	2
Introduce new sedge varieties	2	3	3	1	1
Improve irrigation system	3	2	2	3	1

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