

ADVERSE EFFECTS OF GLOBAL WARMING ON PRODUCTIVITY OF FIELD CROPS AND FARMER LEVEL ADAPTATION MEASURES - A CASE STUDY IN HAMBANTHOTA DISTRICT

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Agricultural crop production is highly sensitive to both short and long-term changes of climate. The tropical vegetable production environment is a mixture of conditions that varies with season and region. Climatic changes will influence the severity of environmental stress imposed on vegetable crops. Moreover, increasing temperatures, reduced irrigation water availability, flooding, and salinity will be major limiting factors in sustaining and increasing vegetable productivity. Therefore, this paper aims to examine the past data on rainfall and temperature, field observation along with farmers experience on the adverse effect of high temperature and less rainfall on various fruit and vegetable crops due to global warming and how farmers adapt to such situations and the constraints for such adaptations. Hundred and fifty farming households were randomly selected for the interviews in Weeraketiya, Weerawila and Pannagamuwa villages in the Hambantota District as they face drought frequently. Semi-structured questionnaires were used to investigate farmers' perceived changes in temperature and rainfall, causes and effects of climate change, and adaptation practices used by farmers. Four focus group discussions were conducted to survey the data. The temperature and rainfall data needed for this study were collected from the Meteorological Department, Hambantota. Further, agricultural productivity was measured as the ratio of outputs to the inputs. The vegetable output is the marketable harvested product or yield. Therefore, it was measured by the percentages of pods cracked (which cannot be marketed) out of the harvested product. In addition, the quality of the product was judged by the physical appearance. Majority of the farmers have experienced high temperature and water stress in the past few years due to global warming. They also confirmed the reduction in rainfall, which agrees with the past meteorological data on rainfall and temperature. This study showed that 48% of the farmers are using mixed crops to face the impacts of climate change such as high temperature and less rainfall as they are not certain which crop will cope with the situation. Out of the harvested product, nearly 75% of the water melon (*Citrullus lanatus*) was cracked due to temperature and /or water stress. Nearly 60% of the snake gourd (*Trichosanthes cucumerina*) harvest was out of shape and nearly 80% of the Okra (*Abelmoschus esculentus*) pods were matured within a short period after flowering. Out of the harvested pods of Cucumber (*Cucumis sativus*) 67% was dark yellow in colour and small in size due to temperature and water stress which affect the marketability. Further, farmers expressed that the lack of information is the major problem for adaptation measures to cope with climatic changes. With properly tailored policies, smallholder farmers can adjust

to climate change and improve their crop production. Finally, it is recommended to assess the feasibility of location specific farm-level adaptation practices to climate change.

Keywords: Global warming, vegetables, temperature stress

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