

of rice production, efficiency of marketing channels and major problems in rice production and marketing in Naghlebhare rice block, Kathmandu.

*Keywords:* Naghlebhare, benefit cost ratio, producer's share, indexing

### **Resource productivity of wheat production in Kanchanpur district, Nepal (PA -MPL -1 -77)**

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Wheat is the third most important cereal crops of Nepal both in terms of production and area of cultivation. However, the domestic wheat production cannot meet its national demand. In this context, the study was conducted to determine the profitability and productivity of wheat production in Kanchanpur district of Far-Western Nepal. A total of 120 wheat growing farmers were randomly selected and surveyed with a semi-structured questionnaire. Descriptive and statistical tools including Cobb-Douglas production function were used to analyze data. The benefit cost ratio (1.81) indicates that wheat production in the study area was profitable with productivity of  $2.53 \text{ t ha}^{-1}$ . The magnitude of regression coefficient (0.24) implied that nutrient cost had significant positive effect on gross returns with estimated decreasing return to scale (0.28). Other costs like seed, human labour, tractor and bullock labour were not statistically significant. Extension of improved nutrient management technologies in sustainable manner is to be encouraged for increase in productivity and profit from wheat production.

*Keywords:* productivity, regression coefficient, Cobb-Douglas production function, B:C ratio, return to scale

### **Socio-economic analysis of food insecurity: A case of Bajura district, Nepal (PA -MPL -1 -86)**

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Food insecurity is the core socio-economic problem of far western development region of Nepal. In this context this study assessed the intensity, determinants of food insecurity and the strategies adopted by the resource poor to cope the problem in lowest developed Bajura district of Nepal. The study district was selected purposively and it was further categorized into two clusters based on upper and lower belt VDCs. Cross sectional 210 household data were collected in 2016 using pretested interview schedule and simple random sampling technique (105 households from each cluster). Intensity of food insecurity was measured using head count ratio, gap index and severity index. Further, binary logit model was used to assess the impact of different socio-economic variables on the status of household food insecurity. About 57% of the sampled households were found to be food insecure while the upper belt was relatively more compared to the lower. The land holding of the household had negative and significant effect on the status of household food insecurity whereas adult equivalent, status of household poverty, and the status of the damage done by drought were positive and had significant effect on the status of the household food insecurity. Working as a wage labor depending on off-farm income, depending on remittance, cutting off food consumption and seasonal migration were found to be the most common coping strategies at household level.

*Keywords:* food insecurity, binary logit, coping strategies

### **Climate change impacts and understanding of local community along Koshi Highway, Eastern Nepal (PA -MPW - 1-128)**

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This study intends to assess trend and people's perception on temperature and precipitation in the Koshi Highway of Eastern Nepal by analyzing the time series of temperature, precipitation and direct field surveys. Trend analysis is analysed and quantified by using the Mann-Kendall trend analysis and Sen's slope. Total seven stations (Terhathum, Chainpur, Pakhribas, Dhankuta, Dharan, Tarahara, Biratnagar) were taken for precipitation and temperature. Altogether 175 respondents were taken by convenience non probability sampling along 30 key informant interviews (KII) and 7 focus group discussions (FGDs). The trend of mean annual maximum except Dharan ( $-0.0034 \text{ }^{\circ}\text{C yr}^{-1}$ ) and Tarahara ( $-0.004^{\circ}\text{C yr}^{-1}$ ) has increased and similarly, minimum temperature except Chainpur ( $-0.14 \text{ }^{\circ}\text{C yr}^{-1}$ ) has increased. The trend of mean annual temperature has increased for all station except Chainpur ( $-0.06^{\circ}\text{C yr}^{-1}$ ). Similarly, annual precipitation has decreased in Chainpur ( $-2.238 \text{ mm yr}^{-1}$ ), Pakhribas ( $-1.719 \text{ mm yr}^{-1}$ ), Dhankuta ( $-4.412 \text{ mm yr}^{-1}$ ), Dharan ( $-8.683 \text{ mm yr}^{-1}$ ), Biratnagar ( $-5.717 \text{ mm yr}^{-1}$ ) except Terhathum ( $0.768 \text{ mm yr}^{-1}$ ) and Tarahara ( $4.403 \text{ mm yr}^{-1}$ ). The seasonal trend shows increase in trend in precipitation in pre-monsoon season and decrease in monsoon (except Terhathum and Tarahara station), post monsoon and winter. The trend revealed that the temperature is increasing along decreased amount of precipitation. Findings revealed that local community in the study area have perceived the changes in environment, weather and climate in particular like high temperature, drought, erratic rainfall, warm winter and drying of wells. The people's perception was positively correlated with climate data. Findings revealed that the threat of climate change is profound on agriculture, water supply and human health.

*Keywords:* climate change, precipitation, drought, rainfall

### **Climatic changes in the mid-hills of Nepal: a study on smallholder farmers' perception and reactions (PA -MPW -1 -65)**

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Climate and weather conditions in the mid-hills of Nepal have always been changing and local farmers have continuously adapted to such change. However, in recent decades these changes accelerated. The awareness of increased climate variability constitutes a prerequisite for adequate adaptation measures in cropping systems. Hence, this study examined how farmers perceive climatic changes and whether their perceptions are confirmed by weather station records. Furthermore, farmers' reactions to perceived changes were investigated in order to assess their resilience to ongoing climate change. To this end, semi-structured interviews were conducted with 60 farmers in a village 15 km northwest of Kathmandu, with half of the interviewees being members of the local agro forestry NGO 'Kaule Environment Nepal'. It was examined whether the time of residency, education level, income sources and NGO membership influenced the perception of and the reaction to climatic changes. Farmers were generally well aware of changes in local climate and their perceptions reflected the weather station per records. Time series analysis showed a significant increase in mean annual temperatures by up to 0.7<sup>0</sup>C decade. Absolute annual rainfall appeared to be stable, however, the annual distribution of rainfall did change, with increased drought during winter. The majority of farmers (59%) did not implement targeted measures in response to weather changes; however, some farmers responded by delaying planting or irrigation. Positive spill-over effects from the NGO may increase awareness of climate change within the entire community. In future, income diversification could contribute to a reduced vulnerability of farmers.

*Keywords:* Nepal, smallholder farmers, climatic changes, perception, reaction

### **Effect of temperature and precipitation on usnic acid production in *Parmelia flexilis* grown at different altitudes of Nepal**

(PA -HBC -1 -196)

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Climate change factors such as temperature and precipitation found to have an important impact on lichen metabolite, usnic acid. In this talk, we would present evidence that there appears to be a reciprocal relationship between the usnic acid and altitude gradients. A total 31 samples of lichen *Parmelia flexilis* were collected from different altitudes (841-2250 masl)) and determined usnic acid concentration quantitatively using high performance liquid chromatography (HPLC). The amount of usnic acid varied in between highest 5.13% to lowest 1.66% in oven dried (80<sup>0</sup>C) lichen samples. The species collected from lower altitudes all show high levels of usnic acid. The negative relationship between usnic acid and altitude was obtained. Statistically, it is revealed that there is a significant difference between average percentages of usnic acid in lichen samples with varying altitudes ( $p < 0.05$ ). Beside these, the precipitation averages of the regions where the species have been collected were linked with the content of usnic acid. It is clear that lichens from the regions receiving the highest precipitation produced lower amounts of usnic acid. The results suggest that the production of secondary metabolite in lichens is also altered due to the climate variables like temperature and precipitation at different altitude gradients.

*Keywords:* Precipitation, *Parmelia flexilis*, usnic acid, HPLC

### **Perception, determinants and barriers to adoption of climate change adaptation options among Nepalese rice farmers (PA -MPW - 1 -12)**

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This paper estimates perception, determinants and barriers to adoption of climate change adaptation options among Nepalese rice farmers. Multi-stage sampling technique was used to source respondents for the study and used structured questionnaire techniques to collect data from 773 households from seven districts-3 from Terai and 4 from Hilly region of Nepal. Binomial logistic regression model was used to detangle the determinants of the adoption of climate change adaptation options among the farmers. Result revealed that about 80.7% of the farmers perceived change in temperature and 90% believed that there is a decrease in rainfall in 30 years period. 77% farm household responds that rice production and yield has decreased due to such changes which force them to the adoption of available adaptation options. This study found mainly 12 adaptation options are used by the rice farmers among them increasing use of chemical fertilizer, use of climate-smart rice varieties, change in nursery date are first three adoption options. Overall 71% of the farmers adopt such adaptation options to protect themselves from the perceived risk. However, farmers are facing several barriers such as capital inadequacy, high cost of agricultural inputs, poor adaptation information to the farmers, inadequate access to credit facility and inadequate awareness about adaptation to adopting such adaptation options. Binomial regression result has revealed that several factors influence farmers' choice of adaptation measures. Our findings suggest the need for greater investment to remove the barriers and institutional set up that helps to improve rice farmers' wellbeing.

*Keywords:* climate change, chemical fertilizer, adaptation

### **Severity of climate induced drought and its impact on livelihood (PA -MPW - 1-132)**

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Climate change and variability is the well accepted fact which causes water stress and has become one of the most pressing environmental problems round the globe. Drought, a slow phenomenon, increases severity in agriculture that is directly or indirectly linked with water. Livelihood of rural people in Nepal mainly depend on agriculture, therefore agricultural drought either results in livelihood diversification or most likely to increase the poverty. Thus, severity of drought leading to migration as a common livelihood strategy was studied in Pakarbas and Chisapani of Ramechhap district. The total annual rainfall was found to