

## The diversity and dynamics of shifting cultivation in the dry-zone of Sri Lanka

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### 1. Introduction

Shifting cultivation, under its diverse forms of slash and burn system, is a traditional method of cultivating tropical upland soils, mostly for subsistence purposes. During the rest or fallow periods intervening between crops, the natural fertility of the soil is restored for renewed utilization in a subsequent period of crop growth. This traditional system of cultivation is in ecological balance with the environment and does not irreversibly degrade the soil resource, provided a sufficient length of fallow is allowed for soil restoration (Ediridhingga & Herath, 2017). Shifting cultivation, locally referred to as *Chena* cultivation, in general, a system of farming in which fields are prepared by cutting down the natural vegetations, letting it dry and burning it off. This technique serves to clear the field and enrich the soil with nutrients from the ash. Traditionally, this form of cultivation is characterized by a mixture of crops a long fallow period and minimal use of agro-chemicals. During the fallow period soil fertility improves and the land once again becomes suitable for growing crops. However, it takes about 10–15 years for the fallow lands to restore the fertility of the soil (Anuradha et al.2019). This traditional practice of Shifting agriculture has been a means of livelihood for many farmers worldwide. However, recent decades, substantial literature highlighted that the Shifting cultivation and the people who practice it are often negatively stereotyped (Waner, 1991). Therefore, aim of this study is to systematic review of present Chena cultivation practices in the Dry Zone of Sri Lanka in economic and ecological point of views.

### 2. Materials and Methods

This study applied mixed approach both quantitative and qualitative research methods. The emphasis on 'lived experience' in qualitative research means that the methods are ideally suited to uncovering the meanings that people associate with events, processes and structures of their lives by way of perceptions, suppositions and preconceptions (Thrupp et al, 1997). The study used focus group discussions and key informant interviews with the help of questionnaires and checklist to meet objectives. Content analysed was used to analysis the qualitative data. This research aimed to analyse the current management practices and existing indigenous aspects of the dry Zone shifting cultivation (*Chena* cultivation) system from the economic viewpoint of farmers who are the main stakeholders of the system. The study completed the pilot survey in Anuradhapura, Kurunegala and Monaragala districts and made 24 focus group discussions in 24 villages. Each district covered 8 focus group discussion and one group represented more than 10 farmers. Hence this discussion depends survey and enormous literature survey on Chana cultivation. Information were analysis with the help of thematic analysis under seven steps. Income, expenditure and related market information were analysis using descriptive statistics.

### 3. Results and Discussion

Ninety-five percent of sample farmers were practicing Chena cultivation on government-owned lands and balance 5% farmers cultivate on their owned lands. More than 90% of households practice Chena agriculture on one land plot and 7% farmers were practicing two separate land plots and only 3% farmers were engaging their Chena practices using more than two land plots. In wet season (*Maha* season), farmers commenced land preparation in August,

cultivate crops in September/October and harvest between December and February. Mean age of the responded farmers was 58 years and majority of farmers were (78%) above 50 age category and only 5% were below 30 years old. In respect to education of sample farmers, more than 62% farmers have studied up to ordinary level and 21 % have completed advance level examination. Balance 17% have completed grade 5 examination.

According to quantitative survey, average monthly gross income of Chana cultivation very from Rs. 60,000 to 250,000 per ha per season. The farmers who applied modern seed varieties, commercialized crops, inorganic fertilizer, pesticide and new technology with man-made water sources have recorded higher gross income of shifting farming. However, the farmers who have cultivated commercialized crops with inorganic fertilizer and pesticide with new technologies have depicted substantially higher cost of production with lower profit margin. The average net income is around Rs 62,000 per ha per season including imputed cost. Major cost component of the study area was recorded as labour (59%), inputs (26%) and machinery (15%) out of the total cost. More than 95% farmers cultivated Maize, Sesame, Kurakkan, Watermelon and Vegetables. Wild life attacks, mainly wild elephants, legal issues on lands. Pest and diseases and marketing issues were highlighted as major problems faced by the farmers in the study area.

Shifting farmers in the study area use a variety of modern inputs. More than 69% of sample farmers have used organic fertilizer, 62% have been used tractors on their shifting cultivation and more than 79% farmers have used agrochemicals with their cultivation practices. Out of total labour usage, more than 62% have used family labour and balance were hired and attham labour specially during the period of land preparation and harvesting. Very few farmers, less than 10% who practice shifting cultivation away from village. More than 65% of sample farmers were repeatedly cultivated same land during last five years and only 23% farmers have changed their land annually since they have separate plots for cultivation. Only 12% of farmers kept the land uncultivated for at least one-year period. For farmers cultivating the same land every year, the follow period is around six months which is the between two cultivation seasons. It is also due to lack of rain water, legal issues and personal problems. According to content analysis, more than 87% of sample farmers were facing elephants' attacks for their crops during last two years.

#### **4. Conclusions**

The study revealed that agricultural land use patterns in traditional dry zone villages have changed in major ways over the last few decades. Such changes included the transition from a shifting-cultivation mode of farming to a fixed sequential mode of farming, the expansion of the per capita cropping area, and the disappearance of communality in agricultural land use patterns. The features, stages and lengths of cycles of shifting cultivation have changed over time. In the Dry zone of Sri Lanka, for example, fallow times historically were as long as 10 years, but are now an average of one years, well below the time required (10 years or more) to allow soil fertility to recover in a fallowed site and this is the main reason for Elephant human conflict. At the same time, shifting cultivators generally have been intensifying their land use practices over time, in many cases through the introduction of new crops and technologies.

## 5. References

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