

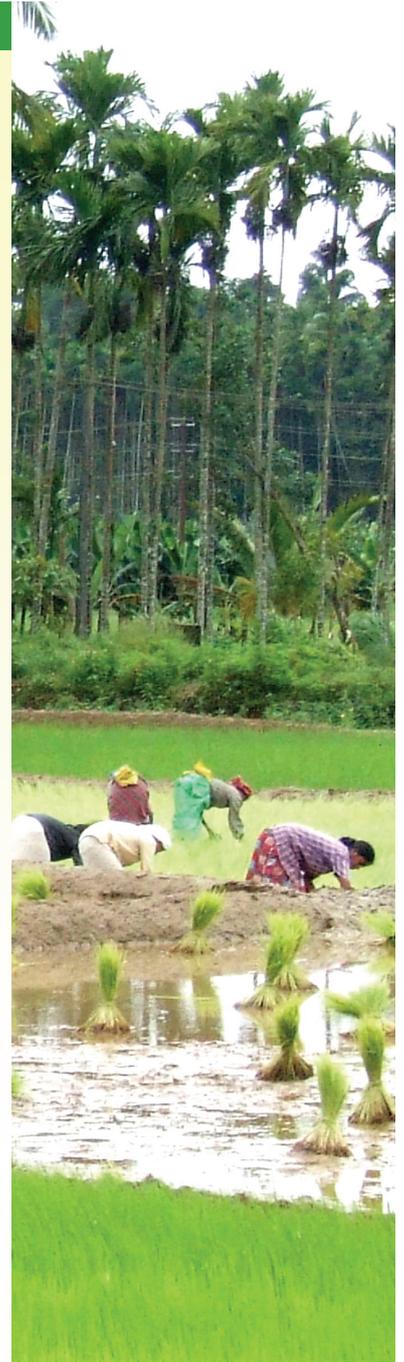
# Resilience in transformation

## A study into the capacity for resilience in indigenous communities in Wayanad

Resilience is broadly understood as the ability of a system to recover after a disturbance while adapting to changes and maintaining its essential functions. The term also refers to the rate of this recovery process; in contrast, a resistant system undergoes slight changes in case of disruption. In the context of this study, the concept of social-ecological resilience is a means to explore the potential resilience of indigenous people with different systems of property rights to adapt to changes in the environment.

The study was carried out among several Adivasi groups, referring to the different indigenous communities in India. Wayanad has the largest Adivasi concentration of Kerala. 20 groups are classified into four broad groups based on their means of income generation: farming communities, agricultural laborers, artisans and hunter-gatherers. Focus of this study are the Paniya, mainly agricultural laborers, as well as Mullu Kuruma and Kurichya, which are farming communities.

Wayanad district lies in the mountainous plateau of the Western Ghats in Kerala state, South India. The area is host to biological, cultural and linguistic diversity, forming a complex social-ecological adaptive system.



## TOPICS

- Adivasi and indigenous communities
- Social-ecological resilience

## BIODIVA

The research project BioDIVA aims to generate knowledge for transformation by examining land use change and agrobiodiversity of the rice farming system in Wayanad, India. The focus lies on sustainability and gender equity, in particular regarding the use of agricultural diversity in indigenous communities. The Indian-German cooperation addresses these issues by conducting inter- and transdisciplinary research accompanied by capacity building and dialogue between local and regional actors.

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## Tradition in times of change

Wayanad is undergoing transformation in land use. The cultivation of food crops such as rice is giving way to cash crops such as banana and ginger. The conversion from traditional varieties to improved rice varieties also carries implications for the future use value of rice farming. Further driving forces of land-use change are the growing real estate market and tourism industry.

These current trends in land use change not only affect land-owning but also landless indigenous people who need to find new strategies to adapt to changes in land-use. In addition, encroachment and illegal transfers of arable agricultural plots of landowning Adivasis is leading to extensive exploitation: Adivasis are highly vulnerable due to limited options in education, health care, sanitation and housing. The recent changes in the social and ecological organisation in turn influences agricultural knowledge of the local communities who have traditionally been rice cultivators. At the same time, social changes such as changing family structures and the reorganisation of labor are taking place. Property rights to land are partly governed by social norms determined by family and kinship.

All these come together to be part of social-ecological transformation processes which call for the development of adaptation strategies among the Adivasis to survive in the uncertain future.

## Analysing social-ecological relations

The interdisciplinary study focuses on the ways in which Adivasis in Wayanad cope with stress in the social-ecological system: *Are indigenous communities resilient to social-ecological transformation processes?*

The research is based on comparisons between three Adivasi communities with different systems of property rights: the land-owning Kurichya and Kuruma and the landless Paniya.

The concept of social-ecological resilience is applied to explore the potential resilience of indigenous people within different systems of property rights. Different systems of land property rights act as a reference frameworks to identify determinants for adaptation to land-use change. We approach the potential for social-ecological resilience to face transformation processes from two different angles: We analyse land users' knowledge about the ecosystem and agricultural management practices within the disciplinary domain of agricultural ecology, and we view social changes through the lens of rural development.

As support for the analysis of indigenous communities' ability to build resilience, we adapt the illustrative method of building a food web from ecology. We combine components of the social and ecological system and cluster functions and structures to put them into relation to each other.

## Data and analysis

In interdisciplinary research, integration is a fundamental requirement, calling for new methods and tools for integration and a common language. In this study, the social-ecological web is derived from the food web used in ecology, and further developed during the process of analysis. Similar to organisms that interact in an ecosystem, different components in an agrarian system are linked in the social-ecological web. It integrates knowledge from rural development and ecology and highlights the organisation within a given community. Social and environmental topics such as livelihood strategies, natural resources, and paddy cultivation take the place of organisms in the web.

The concept is applied to the qualitative data in order to map the complexity of the system and to identify links between different topics and thus to evaluate the resilience potential of the three studied communities. For ease of understanding, ecological terminology is used to describe the social-ecological interrelations.

## A holistic system

Three themes were identified as pillars of sustainability in Wayanad: The environment, agriculture and social organisation. These were classified by their core functions in the system in order to define the potential resilience to land-use change. Internal ecological functions consist i.a. of water cycle, forest, animals and plants. External social functions are income, market and employment. Gender relations and family structures are classified as internal functions. A differentiation of external and internal social functions is helpful for understanding the dynamics of social-ecological systems. The ability to build resilience to land-use change depends on the ways, in which external and internal factors influence social and ecological functions of the system in Wayanad.

When analysing the social-ecological web, it becomes evident that land-owning Kuruma and Kurichya communities are less dependent on external factors than landless Panyia, and, therefore, reveal higher resilience to changes in land-use.

### 3 CORE THEMES

Three main themes play a vital role in ensuring resilience in Wayanad, emerging from of the interdisciplinary synthesis:

#### Environment

This term is used in a broad sense, including the land-users' understanding of causes and effects of deforestation, decimation or loss of natural resources and observed changes in climate patterns.

#### Agriculture

All farming and agricultural practices such as agronomy of rice cultivation, observation and knowledge about pest species and cultivation practices are taken together.

#### Social organisation

The broad theme covers livelihood strategies, income generation activities and opportunities, labour, market dynamics, gender relations and family systems.

## TERMS

### Resilience:

Is the ability of a system to recover after a disturbance while adapting to changes and maintaining its essential functions.

### Sustainability:

Sustainability considers long-term consequences on many levels and across many sectors to achieve the conservation of ecosystems and biodiversity and to maintain productive land use systems.

### Interdisciplinarity:

By involving disciplines from the natural and the social sciences we increase our knowledge at the intersections between disciplines, for example ecology and rural sociology .

### MGNREGA:

Mahatma Gandhi National Employment Guarantee Act (2005) offers 100 days of employment to poor people.

## Experienced environmental system thinkers: Kuruma

Kuruma exhibit a holistic understanding of ecological interactions and the link with traditional cultivation practices, where a shift to modern varieties is associated with changes in use of external inputs, in particular agrochemicals.

- Changing human-animal interaction:

The availability of wild foods to supplement household diet and income is impaired by bans on hunting through the Wildlife Protection Act and the effects of increased agrochemical use in the fields. Increased spending on surrogates puts a stress on disposable household income. Losses in faunal diversity in the fields also bring losses of benefits such as soil aeration by earth worms and pest control by predatory species such as spiders.

- Torn between environmental values and economic rationale:

The pressure to invest in external inputs in order to keep up with market demands forces Kuruma farmers into debt. In addition, members of the Kuruma community increasingly work outside the agricultural sector, making them unavailable for farming with and for their families, who resort to paying for labour.

- Modern role models:

The Kuruma community has adopted an extended nuclear family system brings, which brings about change towards individual land holding, often discriminating women and a new division of labor between the genders. Access to formal education and employment options outside agriculture are opening other avenues for social organisation and livelihood. The MGNREGA scheme offers women opportunities to find work on farms and increase their ability to manage their financial affairs, adding to their families' resilience potential.

## Committed agriculturalists: Kurichya

Similar to the Kuruma, the Kurichya are part of the transformation from traditional to modern farming. The Kurichya have an understanding of the difference in quality of traditional rice in terms of pest resistance and post-harvest damage. Furthermore, they grow traditional rice varieties with longer straw, which they use as fodder for livestock to reduce the need to buy additional fodder. One major concern is the disparity between market price for rice against the rising input costs, which affects resilience and risk mitigation strategies.

- Water management and forest resources:

Kurichya highlight the need for a sound water management system in order to ensure sustainable agriculture. A steady decline in water availability is occurring. Kurichyas link this to irregular rainfall patterns and deforestation. This water shortage affects traditional paddy cultivation and ecological functions of the agroecosystem.

- Living off the land

As with the Kuruma, a decrease in faunal diversity in the paddy fields and decimation of the wild animal population in the forests reduce supplementary food sources. Cultural practices and consumption habits are negatively affected by the loss of natural resources as well as by external factors such as the hunting ban.

- The ability for self-organisation:

The shared knowledge on cultivation practices contributes to a high level of adaptation. This may provide a good basis to adapt to environmental changes and to maintain a functioning system. The shift from the joint to the nuclear family system is a carefully balanced strategy to improve the social resilience by allowing access to increasingly important institutions such as education, non-agricultural income and political power.

## At the margin of society: Paniya

Historically the Paniya inhabited the forests of Wayanad. Being landless, they are highly dependent on natural resources as a collective good.

- Hidden in the forest:

In the past, Paniya collected most of their food and building material from the forest. Deforestation substantially changed not only their livelihood, but also their food consumption patterns. In addition, considering the politically, socially and economically marginalised situation of the Paniya, deforestation as an external factor further impairs their ability to adapt to the decreasing diversity of the landscape.

They need to buy rice and other food which indicates a higher dependency on the market. Consequently, changes in the environment do not only disrupt the ecological functions but also affect Paniya's potential to build social-ecological resilience.

- Landless but dependent on rice farming:

With the replacement of paddy fields by cash crops, less labour in rice fields is available. Even though the shift from paddy to cash crops offers more work in the short-term, it demands a high level of flexibility to cultivate a larger range of crops.



## Results

- ⇒ External and internal factors influence the social and ecological functions of each Adivasi community and affect their potential to build social-ecological resilience.
- ⇒ Land-based resources as well as social organisation play a role in resilience and risk mitigation in times of rapid social, ecological and economic change.
- ⇒ The adaptive capacity to live with changes and uncertainty associated with environmental change is high amongst Kuruma and Kurichya.
- ⇒ The shift from kind to cash economy disturbs Paniya's social functions and organization, which results in a low resilience potential.



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Paniya observe, that as a result of deforestation and climate change, the faunal composition in rice fields is changing, leading to an increased incidence of pest and disease. Furthermore, the use of high yielding rice varieties requires intensified pest management. The lack of knowledge about the agrochemicals and resulting misuse leads to health problems. Ill health affects Paniya's livelihood strategies, because it hampers their capacity for wage labor. Linking deforestation with health problems reveals that disruptions of social and ecological functions of the system are interrelated.

## Conclusion

By comparing the three communities, it becomes obvious, that Kuruma and Kurichya enjoy the privilege of making decisions on cultivation practices due to ownership of land. Moreover they are able to cultivate paddy for home consumption and therefore ensure food security, whereas landless Paniya have to deal with shifting ground and lack means for meaningful adaptation.

Crucial for examining the potential to build ecological resilience is deforestation. It is linked to lack of water and rising temperatures which negatively affects everyday life and agriculture. Paniya suffer from the loss of landscape heterogeneity caused by deforestation differently, because it contributes to further displacement.

The adaptive capacity to live with changes and uncertainty associated with environmental change is high amongst Kuruma and Kurichya. Institutional rules and regulations as well as rural development programs are external factors that influence the social functions of all Adivasi. One major factor that disturbs the social functions and organisation of Paniya is the shift from kind to cash economy. This change leads to low resilience potential because Paniya have few options for self-organisation due to the social, political and economic marginalisation.

The study highlights, how external and internal factors not only influence the social and ecological functions of each Adivasi community, but also affect their potential to build social-ecological resilience. The comparison of landowning Kuruma and Kurichya with the landless Paniya show that land-based resources as well as social organisation play a role in resilience and risk mitigation in times of rapid social, ecological and economic change.