Material and non-material contributions of rice agroecosystems to indigenous farmers in the Upper Baram, Malaysia

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Background and objective

Importance of traditional rice agricultural systems of indigenous farmers:

- Provide staple food, feed, medicine (Garbach et al., 2014)
- Provide income and employment (FAO, 2014)
- Have environmental implications (Cramb et al., 2009)
- Are culturally significant (Tekken et al., 2017)
- Contribute to the diversity of agricultural practices (FAO, 2023)
- **BUT: Rapid change of traditional agroecosystems** (FAO, 2018)

→ **The study investigates indigenous farmers' perceptions of the material and non-material contributions of rice agroecosystem**

Conceptual framework

IPBES framework for **nature's contributions to people** (Diaz et al., 2018)

→ Concept: Nature provides multiple benefits to people

→ All positive/negative contributions of living nature to people's quality of life

→ 18 reporting categories

Methods

Research area and population

- Indigenous groups of the Upper Baram: Kenyah Lepo' Ke, Sa'ban and Penan

Research ethics

- Free, prior and informed consent

Data collection and analysis

- In 2020, 43 semi-structured interviews, snowball sampling (Newing et al., 2011)
- Qualitative content analysis (Kuckartz, 2019) through concept-driven categorisation

Research area: Upper Baram region, in Sarawak, Malaysia (Map: data source: gadm.org; program: ArcGIS, ESRI)


(Hollaus, 2020)

Swidden rice agroecosystem


(Hollaus, 2020)

Wet rice agroecosystem

Material and non-material contributions of swidden and wet rice agroecosystems

Energy
- Firewood (+)*

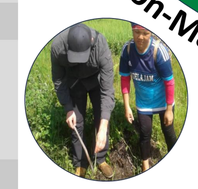
Regulation of freshwater quantity
- Cultivated vegetable, fruits (+)
- Wild food plants and mushroom (+)

Materials
- Building material (+)

Food
- Fish and snail (+)
- Aquatic plants (+)

Physical and psychological experience
- Tiring and difficult work (-)

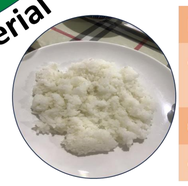
Physical and psychological experience
- Easier work (+)
- More time for recreation (+)
- Support farmers in poor health condition/old age (+)



Learning and inspiration
- Learning by doing and experience (+)
- Knowledge transfer and creation (+)

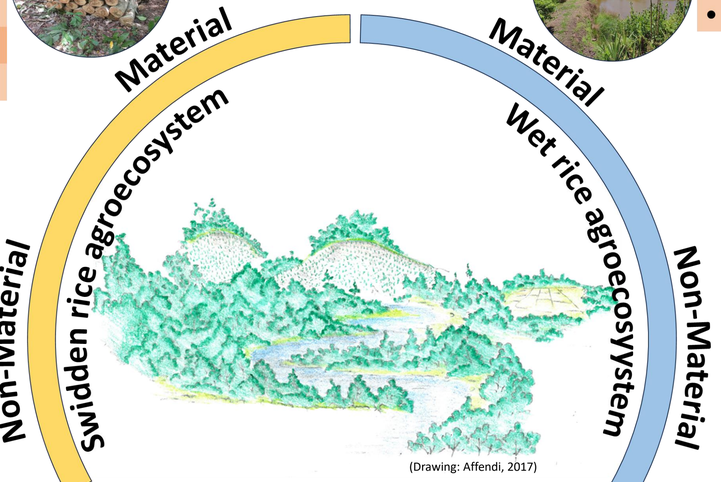
Physical and psychological experience
- The feeling of happiness, of being free and proud (+)
- Provide feeling of livelihood security (+)

Support identities
- Lifestyle and traditions (+)
- Connectedness to place (+)
- Help and share (+)



Food
- Rice (+) (higher yield from wet rice cultivation)

Genetic resources
- Rice varieties (+)



Material contributions
Non-material contributions
*Positive (+) or negative (-) contribution

Results and discussion

Important **contributions beyond rice** (e.g. habitat creation, non-rice food, supporting identity)

→ shows perceived valuable diversity of (non-material) contributions

→ highlights the importance of including indigenous perceptions in the analysis of contributions (Masao et al., 2022)

→ promoted by the NCP framework (Diaz et al., 2018)

Similar but also **different contributions of rice agroecosystems**

- Higher yield of wet rice vs. product diversity of swidden rice
- Differences uses:

→ Wet rice agroecosystem: subsistence, economic purpose

→ Swidden rice agroecosystem: subsistence purpose

Conclusions

- The traditional rice cultivation landscape in the Upper Baram is changing with a trend towards permanent wet rice and cash crops
- Impact of change on the diversity of contributions supported by the swidden rice agroecosystem

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