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Dr. Michelle Daveluy  
Vice-présidente de la CASCA Past President  
Department of Anthropology  
13-15 Tory Building  
University of Alberta  
Edmonton, Alberta  
T6G 2H4

Dear Dr. Daveluy,

I have recently returned from a preliminary five month fieldwork term in the Kolli Hills, South India.

During this period, I worked with and learned from Kollimalai women and men in four villages in the Kolli Hills. I was fortunate to be able to work with two research assistants, one a graduate student at the University of Madras, the other a woman originally from one of my research communities. These women provided valuable assistance and cultural education, as well as encouraging me to work on learning the basics of the Tamil language. We gathered data by conducting semi-structured interviews, focus groups using Participatory Rural Appraisal techniques, and participant observation.

My research focus shifted somewhat away from an examination of the relationships between water resource development projects/priorities, food security and nutrition, to villagers', especially women's, experiences and perspectives on environmental change, cash cropping and food security. This shift was a result of themes that emerged during the research process. Water resource management projects, while relevant to the communities in which I lived and worked, tended to be limited and often non-functional. However, during the research process, the experiences and perspectives of research participants began to reveal a number of themes that relate to food security and dietary diversity. Deforestation, cash incomes, rainfall, and agricultural priorities all work together to influence food security and dietary diversity in my research communities.

Thus, two broad points have emerged out of my time in the field: First, food security does not just mean having enough food to feel full. It includes the quality of food and dietary diversity, and satisfaction with food; and needs to be considered in terms of long-term sustainability. Second, we cannot think productively about food security and nutrition issues in isolation from a larger context. Specifically, my research strongly suggests that food security has to be understood in terms of changes in the environment. This includes the physical environment and the social or cultural environment, how preferences, priorities and practices change over time within households, communities and on larger scales. This is a political ecology approach (Bryant and Bailey 1997) to food security.

There are several points that can be made about food security and dietary diversity in these communities. Environmental factors, both cultural and physical, are affecting the diets of people. Food security/dietary diversity issues are connected with at least two factors: changing rainfall patterns and consequent water scarcity at certain times of the year, and a shift away from subsistence agriculture to cash cropping, with the associated prioritization of a cash income. These two factors are not mutually exclusive, nor are they unrelated to other occurrences. Bohle (1992), for example, details the roles of road and market centre construction in opening the way to cash cropping and food insecurity in the area.

Traditional subsistence crops are less prevalent than in the past, and food is increasingly purchased, rather than grown. Families continue to attempt to grow paddy rice crops in wetland areas, but dry agricultural lands have been turned over to primarily grow tapioca as a cash crop.<sup>1</sup> Since agricultural lands in this area are rainfed, not irrigated, changing patterns of rainfall influence crop productivity, particularly paddy rice grown for household use. Paddy rice crops often fail due to inadequate rain, and villagers therefore rely on purchased rice. This is in addition to other purchased food items, including vegetables, fruits, dried beans and pulses, oil, sugar and lentils. Many of these items were once cultivated, rather than primarily purchased at markets. The dependence on purchased foods means a dependence on the income from tapioca, which raises questions about the sustainability of the crop.

### **Dietary Diversity and Thinking About Food**

Research participants constantly discussed the monotony of their diets. They talked of having a rice-based diet, and compared it to diets in the past, which included at least four types of local millets<sup>2</sup> (*samai, ragi, thinai, varagu*), corn, a wide variety of vegetables, milk, curd, dried beans and paddy rice. During nutritional diversity/food ranking exercises, many traditional foods were not mentioned at all, or were rarely consumed.

However, women consistently ranked rice<sup>3</sup> as the major food consumed in the household, with rasam, a spicy, onion and garlic broth, as the second most consumed. A wide range of vegetables were ranked as medium-consumed foods, suggesting that different kinds of vegetables are regularly eaten as they become available in markets or in fields. *Samai, thinai, ragi* and *varagu* millets were only included in the lists women constructed in two villages. In both cases, these were ranked very low in consumption.

Chicken, pork and mutton are primarily reserved for special occasions. There is a reluctance to regularly consume eggs and chicken in most households, as these either have to be purchased at relatively high costs, or household chickens are being reserved for sale on the market. Milk products appear to be rare at least in part because there is less and less scrubland/grass for cows to eat. This can be linked to the conversion of what was previously classified as 'waste' or grazing lands to cash crop fields.

## **Environmental Changes: Physical, Cultural**

Villagers do not think about food issues in isolation from other changes in their daily lives. Two major physical environmental changes that were consistently identified by women as being connected to food were deforestation for cash crops and rainfall.

Women discussed a decrease in rainfall over the last 10 to 15 years, stating that this problem has been particularly severe in the last two years. There is no quantitative data on decreases in rainfall in the area, other than a mention by Kumaran et al (1998) of changes in monsoon rhythms, but women track changes through memories, previous experiences with plant yields, and the availability of water, including decreases in the quality and quantity of drinking water. Drinking and household-use water shortages are generally most severe in April and May, the hottest months of the year. There are agricultural implications of rainfall changes as well. For example, although there are some days of heavy rain, these are fewer and shorter than in the past. Paddy rice crops may be planted during a rainy period in hopes that the rains will continue, only to go to waste when the rains do not come.

Women also indicated changes in the cultural environment over at least 15 years. Specifically, there has been a turn towards the cash crop tapioca, which can be sold at markets in the plains. Tapioca is the most cultivated crop in this area. While cash cropping has existed in this part of the Kolli Hills for many years, prior to the introduction of tapioca, only small amounts of cash crops such as groundnuts were planted. These kinds of crops could be taken to market without the aid of lorries.

Approximately 15 years ago, transportation for large crop exports became readily available. Around the same time, a few people began to bring back tapioca sticks from plains markets. This crop quickly spread through the area. Deforestation, both rapid and widespread, is one physical environmental effect of tapioca cash cropping. When asked if there had been any changes in the land in their lifetimes, women always talked about forests. They told stories of once only having narrow pathways through the forest. The trees and bushes were so thick that people approaching the village could not be seen. Animals such as tigers, deer, foxes and a wide variety of birds were common. Kumaran et al (1998) have noted that of 17 tree varieties found in the Hills, 11 are now classified as rare or endangered. Women frequently remarked on the changes in forests, stating that clearing the land for tapioca fields is the primary reason for deforestation.

The turn to cash cropping at least in part reflects a preference for cash. Although each household may have different reasons for wanting a cash income, money allows villagers to send children to private schools, and purchase lands, jewels, electronic items and more elaborate clothing. Women also discussed how money has opened their country to them. Specifically, they referred to the ability to travel to places they would previously not have been able to access. In contrast to cash crops, subsistence crops such as millets were classified as having limited value, since, in the words of one woman, "We can only eat them."

However, the prioritization of a cash income over growing food is not uncontested or straightforward. Villagers continue to try and use their wetlands to grow paddy rice for household use. However, drylands, traditionally used for millets, fruit trees, and vegetables, are increasingly being used for tapioca cultivation. While there is some intercropping of corn, tomatoes, onions and other vegetables with tapioca, this is relatively rare.

It should be noted that there was some sense of disagreement about this kind of prioritization. In particular, older women seemed to favour of growing, or at least purchasing better food. Also, there was concern that rice is not a healthy food. Health complaints included feeling weak, becoming easily hungry, having body pains and feeling like "dry husks". These feelings were especially linked with purchased rice. As previously mentioned, local rice crops are increasingly failing, which means that most of the rice consumed is purchased from state ration shops or markets. Women are suspicious of the purchased rice, feeling that it is dirty, of poor quality and contaminated with chemical fertilizers/pesticides.

Kumaran et al frame the introduction of tapioca to the Kolli Hills in terms of pressure from the agro-industry and middlemen moneylenders, stating that "...they have persuaded or forced the tribal farmers to grow tapioca instead of fruit and wild trees" (1998:22). This is likely the case in parts of the Hills. However, the introduction of tapioca into the area where I worked, while influenced by markets in the plains, seems to have been largely a decision that households made for themselves. Research participants do not sell tapioca via middlemen, but rather accompany it to market on hired lorries. Agricultural decisions appear to be linked to a desire for market goods, purchasing lands, and in a few cases, private education for children in these communities.

Research participants wished for a more diverse diet, and often lamented the loss (or limited yields) of their traditional millets. They are concerned about what deforestation might mean for the future of crops, and are also concerned about future water supplies and rainfall patterns, particularly with regards to paddy rice crop successes. However, these sorts of losses are balanced by what are considered to be improvements in quality of life: better access to the outside world, electricity and electronic items, better roads, better education for children, nicer clothes, jewels, more lands. Land and jewels are particularly important, since they are ways to save money for the future and for the next generation. Lands are typically passed down to sons. Women's jewels provide financial standing, and they can be sold should the need for money arise, for example, during droughts.

As I work through my data, I am finding areas and questions that need to be answered during a planned second field visit. These include getting a better understanding of the sustainability of tapioca as a cash crop. From what I know at this point, it appears that tapioca may not be very sustainable, since yields have been decreasing over the past few years. This may be related to rainfall changes as well as soil moisture retention and soil fertility.

While in India, I presented a preliminary analysis of my work to academics at the Third International Conference on Environment and Health in December, and to geographical researchers at the Indian Geographical Society's Annual Conference in February. I was also able to conduct some library research, accessing literature (Kumaran et al 1998; Vedavalli 1998; Kumar-Range 2001; Parimurugan 2001) that would be difficult or impossible to obtain in Canada. Since returning to Canada, I have given a guest lecture to a third-year anthropology undergraduate course (Health and the Environment: Anthropological Approaches) at McMaster.

Please accept my sincere thanks for awarding me the Richard F. Salisbury Award. It is wonderful to have my research supported by CASCA. The award helped support me and my research assistants. I hope that my work will adequately represent the research standards that the organization and its members have set. I am looking forward to presenting my work at the CASCA annual meeting.

Sincerely,

Elizabeth Finnis  
Department of Anthropology  
McMaster University

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## Endnotes

<sup>1</sup> Cash crops were grown in the area before the introduction of tapioca. Primarily peanuts and some fruit crops, the sale of these crops provided income for household items and foodstuffs such as oil and sugar that could not be grown. However, the scale of these crops was limited, and it was only with tapioca that people began to earn large amounts of money.

<sup>2</sup> Millets are higher in protein and nutrients than rice. For example, *ragi* has slightly more protein, 30 times the calcium and twice the iron than rice (Datar & Prakash no date). Most of the women remember millets as the main staples during their childhoods. They stated that they used to have a different kind of millet for each meal, everyday. Now few people grow them, and they are not easily purchased.

<sup>3</sup> Rice is a filling, bulky food. It is not very surprising, therefore, that while women often complained about dietary monotony, they also frequently stated that they "never feel hungry".