

## From growing food to growing cash

### Understanding the drivers of food choice in the context of rapid agrarian change in Indonesia

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#### Key messages

- At our study site in West Kalimantan, Dayak people practicing traditional agriculture consumed more fruit and fish than people living in villages where oil palm was grown. Likewise, at the Papuan study site, those who collected and hunted in forests, ate more fruit, fish and meat than fellow Papuans working in oil palm.
- Those working in oil palm consumed more processed foods, which can lead to chronic illnesses such as heart disease and diabetes.
- Children from the households working in oil palm consumed more dairy products and eggs than children of households practicing traditional agriculture, hunting and collecting.
- Diets associated with traditional livelihoods can be healthy, and in some respects, healthier than more 'modern' diets.
- In both study sites, signs of under-nutrition (stunting, wasting, underweight and anemia) and over-nutrition (overweight and obesity) co-existed. In the oil palm site in West Kalimantan, the rate of wasting among children under five was higher than that seen in traditional households; in the Papua site, there was a higher rate of anemia among mothers working in oil palm, compared with mothers in traditional households.
- Programs should be put in place to encourage people to maintain consumption of healthy traditional foods and avoid too many processed and sugary foods. This will allow people to gain the benefits of market integration without losing the benefits of traditional diets.
- Many wild foods can contribute to healthy diets. Access to forests may help ensure communities consume more of these nutrient-rich foods.
- In Papua, people are switching from sago to rice as their staple food. The health and nutrition implications of this are not well understood, but there is a risk that the cultural value of sago consumption might be lost.

#### Background

Over the last two decades, Indonesia has been experiencing rapid changes, including intense economic development and agricultural transitions with associated land use change. This dramatic transition has been accompanied by rapid changes

in diets in both urban and rural areas. Dietary changes are resulting in new health and nutrition burdens with continued undernutrition and increasingly overnutrition across Indonesia (Development Initiatives 2018). A key driver of these changes in rural areas may be a transition away from traditional agriculture, towards cash crop production. Such a transition could result in adverse consequences for diet and nutrition, since increases in household income do not necessarily translate into improved nutrition (Masset et al. 2012). In the face of rapid change, it is essential to better understand these processes, so as to develop appropriate policies to prevent negative dietary changes and to promote positive aspects of traditional diets.

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This brief summarizes results from a project funded by the Bill & Melinda Gates Foundation and the UK's Department for International Development (DFID), through a Drivers of Food Choice Grant. The project investigated the dietary intake and nutritional status of women and children, in sites in West Kalimantan and Papua, who were living in communities transitioning from traditional agriculture and/or hunting and gathering to livelihoods dependent on oil palm plantations. The aim of the project was to try to understand how changes from traditional livelihood strategies to commercial agriculture are affecting the food choices of rural inhabitants in Indonesia. Here we present some of our findings and provide recommendations that can be used to help create a food environment that is more conducive to healthier food choices in rural Indonesia and to inform more nutrition-sensitive decisions at national, local, industry and household levels.

## Methods

From 2016 to 2018, we collected data in Kapuas Hulu (West Kalimantan), as well as Jayapura-Kerom and Merauke (Papua), in communities undergoing this transition. The differences in sources of foods, reliance on wild foods, diet quality and nutrition were assessed among traditional households and those who either grow oil palm or work for oil palm companies. The study sites were selected based on the presence of both traditional livelihood practices and oil palm production among people of the same ethnic groups living in close proximity to one another (see **Table 1**). This allowed us to compare diets associated with the change in livelihood strategy among people of similar food cultures and culinary traditions. Both areas have high stunting prevalence, according to the Indonesian Ministry of Health (2013). West Kalimantan is in the midst of major oil palm expansion, but still has substantial areas of traditional swidden farming. Papua is thought to be the

next oil palm frontier for Indonesia, since there are still vast tracts of forests and a relatively low population density, but many indigenous Papuans maintain their traditional livelihood strategies of harvesting sago, hunting and fishing. We collected data on dietary intake for mother-child pairs, nutritional status, and source of foods from approximately 500 households in each site. We also conducted multiple focus group discussions involving male and female participants, as well as in-depth key informant interviews, to gain a deeper understanding of the reasons for changes in food choices and habits potentially associated with land use change.

## Differences in nutritional status and diets and between traditional forest and oil palm communities

At both sites, we clearly see different food patterns between traditional and oil palm households. At the West Kalimantan site, mothers in traditional households consumed about 15% more fruit and vegetables overall (in grams), with the biggest difference in green leafy vegetables, which are known to be important sources of iron and vitamin A. Mothers in the traditional households in West Kalimantan consumed almost 30% more green leafy vegetables than those working in oil palm households. Mothers in oil palm households consumed slightly more animal source foods on average, but this differed seasonally, with those in traditional households consuming slightly more fish and meat in the pre-harvest season and mothers in oil palm households consuming slightly more in the post-harvest season. Mothers in oil palm households consumed almost 30% more processed foods than mothers in traditional households; these can lead to chronic illnesses like heart disease and diabetes.

The dietary benefits and costs of the agrarian transition can best be seen when looking at children's diets. The main differences that stand out are that children from traditional swidden households consume substantially more fruit and

**Table 1. Description of study sites**

Characteristics	Study sites	
	Kapuas Hulu (West Kalimantan)	Jayapura-Kerom and Merauke (Papua)
Households		
• Traditional households	• Communities who cultivate food crops using swidden cultivation systems	• Traditional Papuans who hunt and gather foods from forests
• Oil palm (OP) households	• Communities who receive compensation from OP companies regularly or work at the OP companies	• Communities who work at the OP companies and live at their barracks
Ethnicity	Dayak tribe	Jayapura-Kerom: Orya tribe Merauke: Marind tribe
Seasons	Post- and pre-harvest	One season
Number of households	Post- (N=520) and pre-harvest (N=500)	N=465



**Pakis.** Photo by Icaro Cooke Vieira/CIFOR



**Cempedak.** Photo by Icaro Cooke Vieira/CIFOR



**Forest fruit.** Photo by Icaro Cooke Vieira/CIFOR

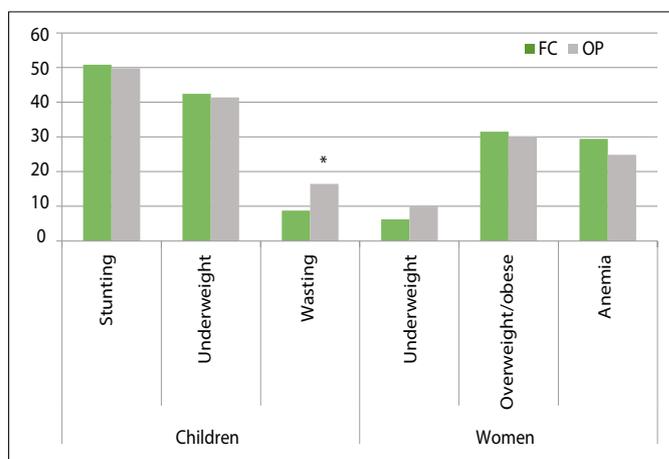
vegetables (depending on the age group), more fish and more staple foods, but they consume much less dairy and fewer eggs. They also, however, consume less sugary foods, and children aged between 4 and 5 years old consume less highly processed foods.

The Papua sites also showed clear differences in dietary patterns between the two household types, and patterns were the same for mothers and children. Women who worked in oil palm and their children consumed less fruit, meat, fish and sago than those who lived in households practicing traditional Papuan livelihood strategies. They also ate more highly processed foods, sweets, vegetables, eggs and rice.

These results indicate that, as more people live in oil palm or market integrated villages, low fruit and vegetable consumption and over consumption of processed foods will most likely increasingly threaten peoples' health.

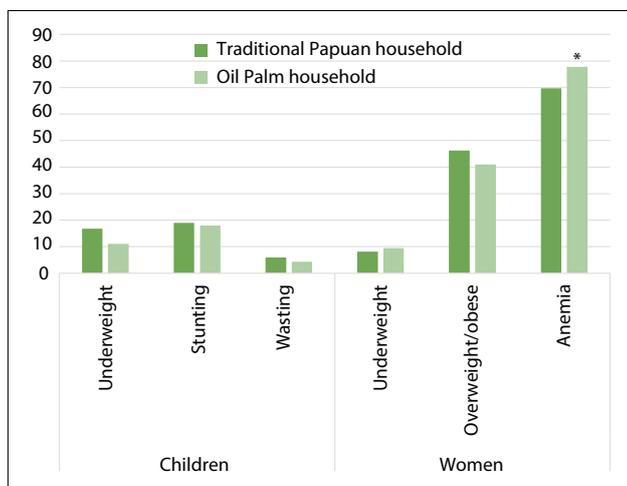
At both study sites, signs of under- (stunting, wasting, underweight and anemia) and over-nutrition (overweight and obesity) among women and children co-existed (Figures 1 to 2). In Kapuas Hulu, the prevalence of children with wasting was significantly higher in oil palm households than in traditional households,

especially during harvest season. In Papua, the percentage of anemic women from oil-palm households was significantly higher than among traditional Papuan households. Local health officials reported that, in recent years, adult chronic diseases (e.g. high blood pressure and diabetes) were among the ten leading diseases in all



**Figure 1. Nutritional status of women and children in Kapuas Hulu (West Kalimantan) by household type (FC: food crops; OP: oil palm) (N=520)**

Note: \* indicates difference is statistically significant



**Figure 2. Nutritional status of Papuan women and children by household type (N=465)**

Note: \* indicates difference is statistically significant

study sites. At the same time, infectious diseases, like acute respiratory infections and diarrhea, are still prevalent. Open defecation (>47% and >16% in Kapuas Hulu and Papua, respectively) and drinking directly from unsafe water sources (24-30% and 5-16% in Kapuas Hulu and Papua, respectively) were still widely practiced in both study areas.



**Selling large local fish from river in Papua.** Photo by Edwin Siswono/Brawijaya University

## From forest to agriculture and cash crop plantations: the impact of land use change on diets and nutritional/health status

The differences in diet, nutrition and health we observed could be explained by a number of things, including:

- Changes in the availability of traditional and wild foods
- Changes in market availability / access to markets
- Changes in how women use their time
- Changes in culture / preference

Forested landscapes give many direct and indirect benefits to people including: food, fodder, firewood, timber and herbal medicines. Across the seasons, forests provide a diverse range of foods including bushmeat (e.g. wild boar, deer, squirrel), plants (e.g. wild mushrooms, fern, fruit), and insects (e.g. caterpillars). These wild foods can be rich in micronutrients like iron and calcium. Rivers and lakes also provide protein-rich foods, such as fish, small turtles ('labi-labi') and river shellfish ('kerang'). In some key informant interviews and focus group discussions, people complained that pollution from oil palm plantations was reducing the number of fish in the rivers.

According to respondents in several focus group discussions in Papua, consumption of wild foods, particularly wild meat and sago, had declined with the decrease of forested landscapes. Local people in several communities reported needing to walk longer distances now to hunt wild animals like deer and 'saham' (tree kangaroos) or to harvest sago, compared to ten years ago.

Infrastructural improvements and better access to markets have also likely affected changes in diets, by increasing availability of eggs, domestic meat like frozen chicken and factory-produced and convenience foods and snacks. At both study sites, cash has become an important means of maintaining household food stocks for local people. Sago-based diets are changing to rice-based diets, especially since rice is more readily available in the market and distributed to all rural inhabitants in Papua as food aid ('raskin').

Households that work in oil palm may also have less time available to collect traditional foods. This is especially true if the landscape has changed and the forest is now far away from their home. Food preferences may also be changing: in key informant interviews, elders talked about how young people just want to eat frozen meat and fried foods and don't value traditional foods. Education campaigns to stress cultural value of 'traditional' foods and their nutritional superiority over many unhealthy 'modern' foods may help to maintain healthy dietary practices.

**Foods consumed more in traditional households**



**Foods consumed more in oil palm households**



**Foods more commonly consumed in traditional vs oil palm households**

## Recommendations

1. As local food systems become increasingly market-orientated, sources of healthy foods may be lost. As such, we recommend that:
  - Agricultural interventions should focus on increasing the diversity of healthy foods in local production systems, for example by encouraging increased production of fruit and vegetables alongside other forms of agriculture.
  - Interventions could provide training on intercropping, growing vegetables in fallow land and the use of bio-soil fertilization.
  - Leveraging agriculture for nutrition could also be achieved via collaborations with oil palm companies; globally, large corporations are increasingly investing in efforts to protect the health of their employees and thus such collaborations could be of interest to these companies:
  - Increasing the availability and market access for foods such as dairy and eggs, particularly fresh milk and free-range local chicken eggs ('telur ayam kampung').
  - Providing vegetable and fruit seeds/cuttings, seedling trees and starter livestock, as well as the required training and space for small-scale gardening in oil palm communities.
2. Companies and government authorities can also practice nutrition-sensitive land use planning. It is recommended that plantations do not come at the expense of forest source foods (see point 3), but also that landscapes are able to support sufficient areas of diverse, traditional agriculture - the main source of healthy and nutritious foods. This includes access to swidden land and agroforestry.
3. Forests provide an essential source of healthy and nutritious foods. New oil palm plantations should be carefully situated to avoid destroying forest sources of wild food. This includes impacts on the direct consumption of forest foods (e.g. sago or wild meat) as well as impacts on indirect sources, such as watersheds important for fish.
4. Health promotion programs also have potential to improve nutrition in both traditional and oil palm communities.
  - The promotion of traditional foods, fruit and vegetables, including wild fruit and vegetables, insects, wild meat and fish, would result in improved nutritional outcomes, as would promotion of diets lower in processed foods.
  - Nutrition education programs could be implemented in communities, schools and health clinics. This could be done by the local health centers ('posyandu').

5. Considering the cultural and social value of sago in Papua, we propose that:
  - Local governments and oil-palm companies need to preserve sago areas.
  - Diversity of staple foods other than rice should be promoted, by sharing local recipes and new recipes for sago/tuber-based diets in nutrition education programs.
6. Infrastructural improvements and better access to markets have increased the availability of factory-produced and convenient and/or energy dense foods, snacks and drinks. To counteract this trend, we propose that:
  - Local governments should encourage local grocery shops to sell healthy foods like vegetables and fruit.
  - Larger-scale public health interventions should be considered to ameliorate the adverse nutritional impacts of increased consumption of unhealthy snacks and processed foods. This could follow the examples of the UK and Mexico, where governments have started taxing unhealthy items like soda.
7. It is necessary to better understand the high prevalence of anemia found in the study sites, particularly in Papua. We recommend that oil palm clinics, in collaboration with the local health centers, carry out regular examinations among women and children for anemia and associated diseases (e.g. worm infestation, malaria), and encourage consumption of foods rich in iron (e.g. heart, liver, legumes).
8. To reduce the prevalence of infectious diseases, we propose that education on good hygiene and sanitation practices (e.g. washing hands with soap, boiling drinking water, use of latrines) is included in health/nutrition education at clinics for oil palm workers, as well as at local health centers.

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