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# Nutrition-sensitive outcomes of a permaculture project in Nepal

Focus group discussion with women during the evaluation, Surkhet, Nepal, 2018

## Location: Nepal

**What we know:** Guidance is available for the design of nutrition-sensitive agriculture projects but few have demonstrated nutrition impact.

**What this article adds:** The Himalayan Permaculture Centre (HPC) is a grassroots project that builds the capacity of farmers to implement permaculture farming techniques with integrated food security, health, education and livelihoods activities. Explicit nutrition objectives are not included. An evaluation of the HPC was carried out in April 2018 through focus group discussions and individual interviews with HPC staff and beneficiaries. Respondents reported uptake of a range of improved farming techniques and livelihoods activities that have diversified agricultural systems, led to improved yields, increased household income, improved water, sanitation and hygiene practices, and reduced women's workload (leaving more time for household hygiene, child care and appropriate infant and young child feeding). Households reported improved dietary diversity. There is strong potential for the HPC to impact on nutrition positively. Lessons learnt from other nutrition-sensitive programmes can be applied to HPC to help increase nutrition impact, such as integrating behaviour change communication. Women's participation in the programme, access to markets and nutrition and health education are key areas now being addressed.

## Background

The nutrition situation is improving in Nepal but remains a serious public health problem. The latest data shows that 36% of children under five years old are chronically malnourished, a substantial reduction from 57% in 1996 (Ministry of Health Nepal and New Era 2017). The Himalayan Permaculture Centre (HPC) is a grassroots, non-governmental organisation set up in 2010 by trained farmers from Surkhet district in mid-west Nepal that aims to build sustainable agriculture and resilient domestic food and energy security through rural development programmes. It builds on experience gained over the past 30 years in training and implementation of permaculture design and practice in remote and challenging environments in Nepal.

The HPC works with 850 households in two rural districts in the west of Nepal, Humla and Surkhet, with an annual budget of approximately £84 (12,800 Nepalese rupees) per household. The HPC is nearing the end of its 'Building Livelihoods for Household and Community Re-

silience' (BLHCR) project (2015-2018), through which work is organised around five areas: food security, health, education, livelihoods and capacity-building. A range of over 45 techniques is used to increase and diversify farm productivity; reduce cost of domestic activities (in terms of time, labour and money); improve health through better nutrition, hygiene and reduced work load; use and recycle local resources; and protect the environment. The four main components of the project are: i) demonstration of techniques, ii) training of communities, iii) provision of resources, and iv) research on techniques and approaches. Activities are supported in the communities through capacity-building by HPC technicians and 'Barefoot Permaculture Consultants' (BC)

– farmers who have been selected by communities for their leadership, technical knowledge and successful application of techniques.

The HPC is a multi-sector programme with activities and planned outcomes that cross the disciplines of agriculture, livelihoods, health and the environment, among others. While improvements in nutrition are not mentioned explicitly in the objectives, many elements are in place to support adequate food and nutrition security (FNS) and the HPC offers a good case study to show the potential for permaculture to support FNS.

The case study here is not an evaluation of the BLHCR project, but a longer-term assessment of the ongoing work of HPC in Surkhet, where HPC works with 265 households. The study was commissioned by HPC as impact assessments have not been carried out to date and there is interest in improving activities for nutrition impact. The study aims to assess the potential of the HPC to improve nutrition and to identify longer-term research and evaluation plans for the HPC and other similar multi-sector programmes.

## Methods

An initial literature review and guidance from peers supported development of participatory research tools. Question guides were developed for focus group discussions (FGDs) and key informant interviews. Field research was conducted over a period of three weeks in April 2018 in Surkhet. FGDs were carried out with female members of farmers' groups (n=7), male members of groups (n=6) and an adult literacy group (n=1). Individual interviews were carried out with two HPC staff members, six BCs, one teacher, two women farmers and two local health workers. Findings were presented at a workshop of HPC

Permaculture may be defined as "The conscious design and maintenance of agriculturally productive systems which have the diversity, stability and resilience of natural ecosystems. It is the harmonious integration of the landscape with people, providing their food, energy, shelter and other material and non-material needs in a sustainable way." Geoff Lawton, Permaculture Consultant, Designer and Teacher

technicians and BCs and a theory of change was developed. A final workshop with HPC was used to discuss recommendations and next steps.

## Findings

### *Coverage and participation in training*

Training is open to all members of farmers' groups in the HPC villages. Participation in training is skewed towards men, with 39% of eligible men and 28% of eligible women attending technical training between November 2017 and April 2018. There is a perception that health and nutrition training is geared towards women and livelihood and agriculture training is geared towards men. The majority of BCs are male, despite efforts to recruit and maintain women.

### *Adoption of new techniques*

Respondents reported many new techniques that they had implemented as a result of the HPC, including fruit nursery, beekeeping, cash crops, composting, tree planting, covering food, house cleaning and many others. New crops mentioned in particular were plums, pears, peaches, kiwis, almonds, oranges, mulberries, figs, bananas, fodder trees, green leafy vegetables, garlic, onions, tomatoes and cash crops. HPC six-monthly reports (available from [www.himalayanpermaculture.com/reports/](http://www.himalayanpermaculture.com/reports/)) give more detail on the techniques adopted in each six-monthly period.

### *Building of resilience and productive agriculture systems*

Challenges to farming highlighted were drought, pests, lack of market access and reduced rural labour due to migration. The HPC has met these challenges by introducing diverse, perennial agriculture systems with a rich mix of species in agro-forestry systems using a range of propagation techniques. Improved livestock breeds have been introduced, while stocks have been reduced to allow natural forest regeneration of hillsides and reduce labour demands. Composting and water systems are managed to support increased production. A system of rice intensification (SRI) has been introduced that requires less labour, seeds and weeding; those using SRI reported increases in yields (although there is no data available to verify this). Increased yields were also reported for corn wheat and buckwheat due to succession planting, water provision and new techniques such as intercropping. A wide range of fruits and vegetables has also been added that are faster growing with greater yields.

### *Improved livelihoods*

Livelihood improvement is a key aim of the HPC in order to stem outward migration and address poverty. HPC supports livelihoods through micro-credit schemes, beekeeping, vegetable seed production, cotton growing and processing, developing mills, growing and processing herbs and cash crops (with weaving and processing of fruit and vegetables under development). Access to markets, particularly for perishable foods, was a limitation cited by communities in this research; activities to address this are planned by the HPC.

### *Income expenditure*

Respondents reported increased household income due to HPC livelihood activities, such as sale of

cash crops, honey, fruit and vegetables, fodder plants and seedlings, and money saved; for example, due to less need to purchase goods now produced at home, such as fruit and vegetables and sugar (due to honey production). Respondents reported spending additional income on school fees, soap, clothes, medicine, stationary, festivals and foods (salt, sugar, pulses, oil, rice and noodles), some of which may have direct and indirect, short and long-term nutrition-related benefits (soap on improved hygiene, for example).

### *Diets*

Most FGD participants reported increased consumption of fruits, vegetables and pulses since joining the HPC. For some households consumption of animal milk has fallen due to labour shortage for livestock rearing; however, the mitigation measures put in place (such as fodder supply, improved breeds and improved water supply) appear to have minimised this effect. Persistent challenges for nutrition include loss of nutrients from over-cooking vegetables and over-processing rice, which are ingrained habits, and the tendency to use additional household income to purchase processed foods to replace traditional, healthier foods. Cooking demonstrations, food processing, food combining and use of sarbotum pito (a locally developed complementary food) are strategies that HPC has used to address these problems, although widespread use of bought processed foods was reported by respondents and HPC staff. There is little data on local malnutrition prevalence to compare with national data; however, respondents remarked that health and nutrition had improved. Data is needed to verify these reports.

### *Gender empowerment*

HPC activities appear to have been effective in reducing the time and drudgery of women's work; for example, through the application of special technologies such as energy-efficient stoves. Respondents also reported time saved through improved sustainability of natural systems (improved water systems, soil fertility and reforestation and growing fodder trees close to the homestead); an impact not widely recognised in the debates on women's time and nutrition. Female respondents reported having more time to spend caring for children, attending to household cleanliness and hygiene, preparing special meals for children, engaging in income-generating activities or social enterprises and attending meetings/socialising. Women's energy expenditure on heavy agricultural work and fetching water and fodder is also reduced, which impacts on energy requirements.

### *Nutrition and health promotion*

HPC nutrition and health-promotion activities include nutrition training, cooking demonstrations and health fairs. The farmers' manual includes a chapter on diet and nutrition, where nutritional properties of foods are described and guidance is given on food processing, production of sarbotum pito and care of the sick or malnourished child. Hygiene practices are also well covered in the training curriculum. Shortcomings are the absence of sufficient guidance on breastfeeding practices and absence of targeting of nutrition and health training to women

during the first 1,000 days. Several women reported that they had received health and nutrition training on topics such as infant and young child feeding (IYCF) and news menus, although for some the training was between two and four years ago. Women also appreciated training they had received on plant propagation, fruit tree planting, salt lick for livestock, energy-efficient stoves and household hygiene practices.

### *Maternal care during the first 1,000 days*

Adequate maternal and child care is critical to the prevention of malnutrition; the global recommendations are for pregnant women to consume a healthy diet with adequate intake of energy, protein, vitamins and minerals to meet maternal and foetal needs (WHO, 2016). HPC may contribute to improved maternal care by increasing the availability of nutritious foods and reducing women's workload. Responses from some women indicate a positive impact; for example, "I consume fish, meat, milk and curd during pregnancy. After giving birth I rest for four months at home. During that time I can feed my child four or five times per day. When I have to return to the fields this is reduced?". However, respondents from another village reveal no culture of reducing workload or special attention to a woman's diet during pregnancy. It is not clear why there are differences between villages. A prevailing serious problem with anaemia among women was reported, caused by excessive bleeding (due to inappropriate use of contraceptives) and poor diet.

### *IYCF practices*

Older women reported that IYCF practices have improved greatly since the start of HPC due to time-saving activities and the greater availability of diverse foods, which are important for IYCF. However, the health professionals interviewed estimate that half of women do not exclusively breastfeed to six months and use breastmilk substitutes (BMS) such as buffalo milk, sarbotum pito and family foods. FGDs confirm this and revealed challenges to exclusive breastfeeding for the first six months, including perceived lack of milk, lack of time, close birth-spacing and early marriage. The uptake of sarbotum pito appears to be mixed, with some mothers relying solely on family foods (rice, dhal and vegetables) even when ingredients for and time to prepare sarbotum pito, a valuable complementary food, are available.

### *Improved water and sanitation and hygiene practices*

The HPC has introduced many hygiene-promotion activities and easy-to-implement technologies to help improve food safety and hygiene practices. The provision of piped water to households and sanitation is a key benefit for health. Time saved by women due to HPC-introduced practices has resulted in more time for light domestic work, with reported benefits for house cleanliness and washing clothes. Sanitation has also been supported by the HPC. Toilets (either composting or traditional) are now widely available.

Informed by the findings, a theory of change (ToC) was developed for outcomes of the HPC

combination of interventions (Figure 1). The ToC shows clearly how the different HPC approaches interact and converge to build potential for improved nutrition. Women's time is saved through a combination of activities, including technologies, environmental improvement and supply of basic services such as water and animal fodder. Food systems are diversified through agroforestry, natural resource management and fruit and vegetable gardens. Income can be used to improve nutrition or for purchase of highly processed foods that are not nutrition-enhancing. Nutrition and health education can be used to modify this effect.

## Limitations

Other projects were being undertaken in the same locations, so not all reported benefits can necessarily be attributed to a HPC. Baseline data and a comparison survey would help to assess attribution. It is possible that respondents over-emphasised the benefits of the project; FGDs were limited to community members without HPC staff present to mitigate against this risk.

## Recommendations

The strength of the HPC is the integration of its different activities for multiple purposes. This is inherent in permaculture designs which work to address the multiple challenges and needs of communities. The following specific recommendations for HPC were formulated on the basis of the review:

1. Create a specific objective and budget-line for nutrition in future projects to help prioritise and manage nutrition-related activities.
2. Collaborate with a research organisation to implement systematic, regular data collection across sectors, including baseline data in new villages.
3. Collect data against nutrition-specific indicators; e.g. dietary diversity score and sample household weekly food consumption

record collected in different seasons.

4. Improve women's participation and recruitment and retention of female technical staff and BCs by broadening selection criteria from farming techniques and providing child creche facility and children's meals during training sessions.
5. Promote nutrition training that emphasises the importance of home processing and cooking to men as well as women and include HPC staff, technicians and BCs. Target special training on IYCF and maternal care to pregnant and lactating women. Training materials on IYCF practices need updating, particularly the section on breastfeeding.
6. Facilitate a training of trainers (TOT) for technicians and BCs in health and nutrition and build the capacity of health workers to support training delivery.
7. Develop a marketplace for nutrient-dense foods identified as inadequate in the local diet.
8. Provide training and support on people-centred topics for BCs, technicians and community members, such as time management, personal empowerment, confidence-building, report writing, public speaking and planning.

The HPC made several changes in the six months following the review as a result of these recommendations. The selection criteria for technicians and BCs has been broadened to include women with gender-related training (such as training in women's health and gender advocacy), and older women have been recruited with broad experience and who are no longer responsible for young children. Creches and children's meals have been introduced during training sessions to enable women to attend. Some men have now received basic training in nutrition and health topics and plans are in place to offer IYCF and maternal care practices training to pregnant women, increase training on home processing

and cooking, and offer 'people and permaculture' skills training. A part-time nurse has been recruited to assist with health and nutrition training in Humla district and HPC has now developed and delivered a women's health TOT for the first time for nine women and nine men in Humla.

A research project has also since been carried out to test the nutritional quality of rice grown using the system for rice intensification versus traditional rice (data have not been yet analysed). Indicators have been developed to monitor all aspects of HPC and a research concept has been written; funding is currently being sought.

## Conclusions

Nutrition has not been strongly emphasised in the HPC approach; nevertheless many of the activities have strong potential to impact on nutrition positively. Some of the lessons learnt from other nutrition-sensitive programmes have been drawn into guidelines that can be applied to HPC to help increase nutrition impact. For example, it is widely acknowledged that agriculture programmes are more likely to show positive impact on nutrition where behaviour change communication for nutrition is included (FAO 2013).

Using the permaculture design, integrated systems that cross traditionally separate sectors can be used to build health and nutrition of communities in a socially, economically and environmentally sustainable way. With the multifaceted challenges faced by rural Nepalese communities, a truly multisectoral programme approach is essential and HPC offers a model for similar contexts.

HPC staff and BCs are already working as ambassadors for permaculture. The work carried out by BCs in the 2015 earthquake response (where farmers from the HPC went to help earthquake victims) is evidence of the value of HPC's work. After the earthquake the BCs were deployed to eastern districts of Nepal to help rebuild communities using permaculture designs and techniques. Further opportunities for this type of outreach to expand the reach of permaculture in Nepal would be valuable. The sustainability of HPC relates to low costs and the capacity that has been built for control of the project by local people.

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