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Transforming the Lives of Mountain Women Through the Himalayan Nettle Value Chain: A Case Study From Darchula, Far West Nepal

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Naugad is a remote rural municipality in the mountains of far west Nepal with poor accessibility and limited economic opportunities, especially for women and marginalized communities.

Promotion of the natural resource-based value chain for allo (the Himalayan nettle, *Girardinia diversifolia*) was identified as an innovative livelihood strategy by the local community. Value chain development started in 2014. The project was designed to focus on women and include participation by the private sector. This paper analyzes the impact of the project, especially on women's lives, using primary and secondary data. A community-owned enterprise was established with private-sector support from the South Asian Association of Regional Cooperation's Business Association of Home Based Workers (SABAH) Nepal. The enterprise now has 82 members (69 of them women), with 150 households benefiting directly and indirectly. SABAH Nepal provided training in sustainable harvesting and processing techniques and promotes the

products in high-end international markets. A buyback guarantee scheme provides security to local artisans. The quality and range of allo products have increased markedly, as has the share in benefits for local people. Skills training and visits to trade fairs have helped women build their capacity and take a leading role in the value chain process. The community-owned enterprise members have earned up to NPR 4000 per month from sewing, more than the local rate for day labor and sufficient to cover general household expenses. More than 25 women entrepreneurs have started microbusinesses related to allo. Allo has become an important economic asset, transforming the lives of mountain women in this village area. The approach has potential for scaling up across the subtropical to temperate areas of the Himalayan region in Bhutan, China, India, Myanmar, and Nepal.

Keywords: Allo; Himalayan nettle; *Girardinia diversifolia*; mountain women; common facility center; poverty; sustainable livelihoods; value chain; private sector.

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Introduction

Naugad is a small rural municipality in Darchula district in far west Nepal with poor accessibility, low economic development, and limited livelihood opportunities. As a result of its remoteness and lack of basic facilities, the proportion of villagers living in poverty is greater than the national average. Residents have traditionally depended on subsistence farming supplemented by collection and sale of non-timber forest products (NTFPs), such as the caterpillar fungus *yarshagumba* (*Ophiocordyceps sinensis*), for their livelihoods (Negi 2007). *Yarshagumba* is a high-value medicinal herb, mostly found in alpine and subalpine pastures of the Tibetan plateau and the Himalayas, that is becoming one of the biggest contributors to the cash economy in high mountain areas of Nepal (Shrestha and

Bawa 2013; Pant et al 2017). Men, women, and children risk their lives on the high mountain slopes to collect it (Pant et al 2017).

In recent years, considerable competition has emerged between local residents and outsiders, as well as among local collectors, for control over *yarshagumba* and other NTFPs, which has threatened the local people's livelihoods (Pant et al 2017). At the same time, men have started to migrate to India and other countries in search of employment, leaving women with extra responsibilities as heads of household (Sharma 2011). The cultural and social norms of the area also tend to limit the possibilities for women and members of other marginalized groups to explore new opportunities. Traditionally, women marry early and are confined to the household. Working outside

the home and earning income to support the family are not encouraged.

The Himalayan nettle *allo* (*Girardinia diversifolia*, also called *puwa* in western Nepal) is a fiber-yielding, self-sustaining perennial herb that can grow up to 1.5 m high (Singh and Shrestha 1988; Barakoti and Shrestha 2009; Gurung et al 2012; Radhakrishnan and Preeti 2015). *Allo* is widely distributed in the subtropical and temperate Himalayas and grows in mountain and hill areas across Nepal at elevations between 1200 and 3500 masl (Singh and Shrestha 1989; Shrestha 1997). After cutting, the dry bark is peeled off and fiber is extracted by boiling, washing, and beating. *Allo* fiber has physical and mechanical properties that are better suited to textile work than other commonly used fibers and the longest fiber length of any natural fiber (Lanzilao et al 2016).

Traditionally, the fiber has been processed, spun, and woven to make coarse products—jackets, cloth, headbands for carrying, rope, mats, fishnets, grain sacks, bags, and blankets (Singh and Shrestha 1985; Shrestha 1997; Clarke 2007; Barakoti and Shrestha 2009; Pyakurel and Baniya 2011; Gurung et al 2012)—both for direct use and for exchange for grain and other goods (Duthie 1960; Singh and Shrestha 1988). However, there is a growing interest among the local people, government, and private sector in the development of finer commercial products from *allo* (Subedee et al 2017), and the plant has been recognized as an NTFP with high potential for generating rural income, especially in mountain and hill areas (Gurung et al 2012). There is a high demand for clothes made from woven nettle in national and international markets, and they are a prime Nepalese souvenir product (ICIMOD 2015; Subedee et al 2017). At the same time, the textile industry worldwide is looking for alternative sources of natural fiber to reduce dependence on cotton and silk. India has already recognized the potential of naturally occurring nettle and has added the plant to the list of potential plants for use in producing commercial fiber because of its abundance (Radhakrishnan and Preeti 2015). To increase quality and demand, Uttarakhand has initiated scouring and softening of nettle without the use of chemicals and blending with organic cotton or bamboo (at a 50:50 ratio) to make it suitable for open-end spinning (Radhakrishnan and Preeti 2015).

Around 1805 tons of nettle thread are produced in Nepal annually (MEDEP 2010), with half the production consumed in country and half exported. It is mostly used for making carpets and textiles. The total export value of *allo* products from Nepal was NPR 7 million (about US\$ 68,000) in fiscal year 2012–2013 alone (TEPC 2014). An estimated 20 tons of raw *allo* bark is produced annually in Darchula, with 8–9 tons of this coming from Naugad (ICIMOD 2015). Despite *allo*'s substantial availability, until recently, local people had limited knowledge and awareness of the possibility of developing sustainable *allo*-based enterprises and effective value chains.

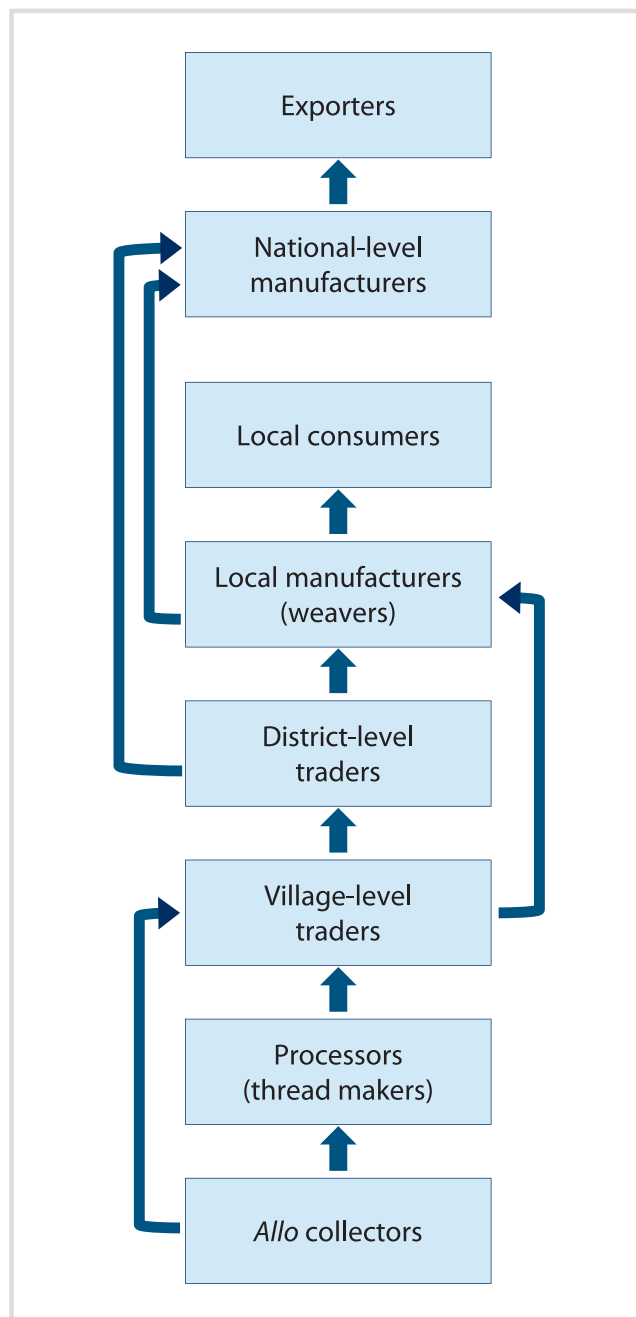
Kaplinsky and Morris (2001) defined value chain as the “full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use.” According to Mitchell et al (2009), the development of value chains should use a practical approach that supports specific target groups and is useful in understanding how poor people in rural areas of developing countries can efficiently engage in domestic, regional, or international trade. It is a stepwise process to create a sustainable approach to enable local producer communities to generate employment and gain an equitable share of benefits from their local products (Figure 1). Actors who are part of the value chain mechanism include collectors, processors, manufacturers, traders, and consumers who work together for improving the supply of inputs, extension services, and access to market facilities (ICIMOD 2015; Rasul et al 2016). The value chain approach is arguably one of the most effective ways to improve linkages between businesses and poor communities, tackle poverty, and develop a local resource-based enterprise that benefits local people (Mitchell et al 2009; IFPRI 2016).

However, researchers have found that value chain development often denies access to women and does not recognize their knowledge and contributions (Bhattarai et al 2010; USAID n.d.). Similarly, communities can use small and medium enterprises to generate employment in extractive operations, but only about a third of the workers in these enterprises are women (World Bank 2014), and the women working in them are often paid inadequately (USAID n.d.).

One way to ensure the inclusion of women is to develop women-owned enterprises. This can increase women's financial independence, help them overcome their lack of assets, empower them, and provide them with a voice in the community. According to a recent study (Gurung et al 2012), women have traditionally been responsible for all stages of processing *allo* fiber and weaving *allo* products in Nepal. *Allo* has a high cultural and religious value in the Kulung Rais community, where the cloth made of *allo* is offered to God in special religious events and presented to brides by their parents during wedding ceremonies (Barakoti and Shrestha 2009; Gurung et al 2012). Thus, *allo* has particular potential for supporting women's development in Nepal (Gurung et al 2012).

In developing countries, job creation is a high priority for government and development partners and other public and private institutions whose aim is to reduce poverty and achieve pro-poor growth (OECD 2009). In most cases, development partners emphasize policies and projects that improve the competitiveness of the private sector to create jobs (OECD 2009). Private-sector entities

FIGURE 1 Links in the *allo* value chain in Naugad. (Based on ICIMOD 2017)



include large multinational companies, medium- and small-scale local enterprises, and farmers; they provide necessary goods and services to improve people's lives and are key to stimulating economic growth (OECD/WTO 2015). The private sector plays an important role in enabling business organizations to expand their production frontiers, achieve cost advantages, and enhance their competitiveness and strength (OECD/WTO 2015). Global value chains provide the private sector in

developing countries with access to networks, new markets, capital, knowledge, and technology that lead to more diversified and powerful economic growth (OECD/WTO 2015). By promoting low-cost innovations, the private sector can contribute greatly to sustainable development (GIZ 2013), while private-sector engagement helps to ensure continuity of activities after completion of a project (IFPRI 2016). However, attracting private-sector engagement in remote mountain areas is difficult, and it is important for development partners to identify private-sector entities with a social and environmental "sound" approach rather than simply focusing on economic viability.

In 2014, the Kailash Sacred Landscape Conservation and Development Initiative (KSLCDI) Nepal—a joint initiative of Nepal's Ministry of Forest and Soil Conservation, the Research Centre for Applied Science and Technology, and the International Centre for Integrated Mountain Development (ICIMOD), aiming to improve the livelihoods of poor communities in selected far-western districts of Nepal while ensuring efficient use of natural resources—identified development of the *allo* value chain as a high-priority livelihood strategy for communities in Naugad (ICIMOD 2015). The project was designed to achieve the goal with the participation of the private sector and specific focus on women. To ensure a sustainable local supply of *allo* products in Naugad, a private-sector entity partnered with community groups formed by women. Women members were trained in order to improve their skills to meet the required quality and volume specifications. The project ended in December 2017, and this paper analyzes the project's impact on local livelihoods, and especially on women.

Methodology

The methodology was based on the modified value chain analysis framework (Kaplinsky and Morris 2001; Hoermann et al 2010), which emphasizes inclusiveness and mountain specificity and follows the guidance for pro-poor value chain development with a focus on gender mainstreaming offered by Joshi et al (2016).

Study site

Naugad (known as Khar Village Development Committee until 2017, when it was renamed under Local Government Act 2074) is a small rural municipality in Darchula district in far west Nepal (29°45'40.06" to 29°49'2.33"N, 80°35'51.11" to 80°41'0.11"E) within the Api Nampa Conservation Area, 12 km from the district headquarters at Dallekh to the northeast. It is around 1650 masl and covers an area of 26 km². It has 698 households with a total population of 4272 (2056 male and 2216 female) (NHPC 2011). According to a baseline survey conducted as part of the study in 2015, the 2 main population groups in

Naugad are the Chettri (89%) and the Dalit (7.3%). In Nepal, the Chettri are generally considered socially and economically strong. However, because Naugad lies in the remotest part of the country, even members of its Chettri community are economically weak compared to urban dwellers. Women and Dalits are both identified as marginalized groups in Nepal's Constitution. Marginalized communities are those with less access to political, economic, and social opportunities because of their caste, culture, or sex.

Situation analysis and value chain selection

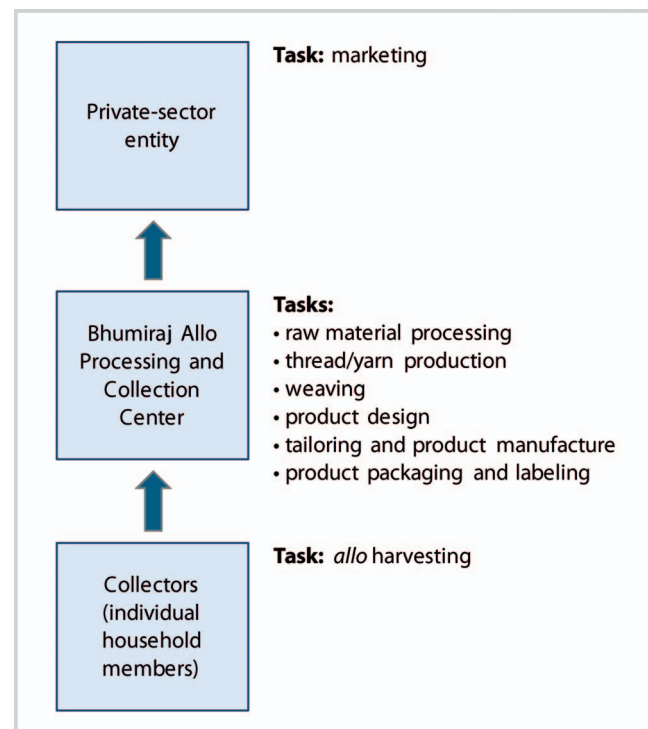
Allo was selected as a potential livelihood source, especially for women, following a stakeholder consultation carried out in 2014 in Naugad with local residents, existing *allo* producers, local entrepreneurs, and local government representatives. The consultation included a household survey conducted with members of *allo* producer groups in Naugad, 5 focus group discussions held with the members of *allo* producer groups, local government agencies, and women's groups at the community level in Naugad, followed by in-depth interviews with women and members of other marginalized groups in Naugad. Skills testing was carried out on yarn processing, weaving, and sewing, and the results were used as a basis for designing the skills-training part of the project.

Description of the private sector's involvement

In 2015, the KSLCDI team held a consultation meeting with the private-sector entities on potential areas for collaboration on strengthening the *allo* value chain in Naugad. One of the major criteria set by the initiative was to select a private-sector entity considering social and environmental aspects, in addition to economic outcomes in business. The South Asian Association of Regional Cooperation (SAARC) Business Association of Home Based Workers (SABAH) Nepal, a national organization possessing a South-Asian wide network that is promoted by SAARC, was selected for the *allo* value chain-strengthening project in Naugad. SABAH-Nepal is registered as a social business organization. Unlike other private-sector entities, SABAH Nepal's approach is to develop common facility centers in which members of the facility centers work together to add value to products at the local level. This gave SABAH Nepal an advantage in enhancing the quality of products and in marketing products made by rural women and men to ensure the sustainability of the project.

In 2016, with support from the KSLCDI, SABAH Nepal and the Naugad community established the Bhumiraj Allo Processing and Collection Center (BHPC). The BHPC is registered as a community-owned enterprise and is the focus of this study. SABAH Nepal provides skills training in sustainable *allo* harvesting, processing, and

FIGURE 2 Role of the Bhumiraj Allo Processing and Collection Center in the *allo* value chain.

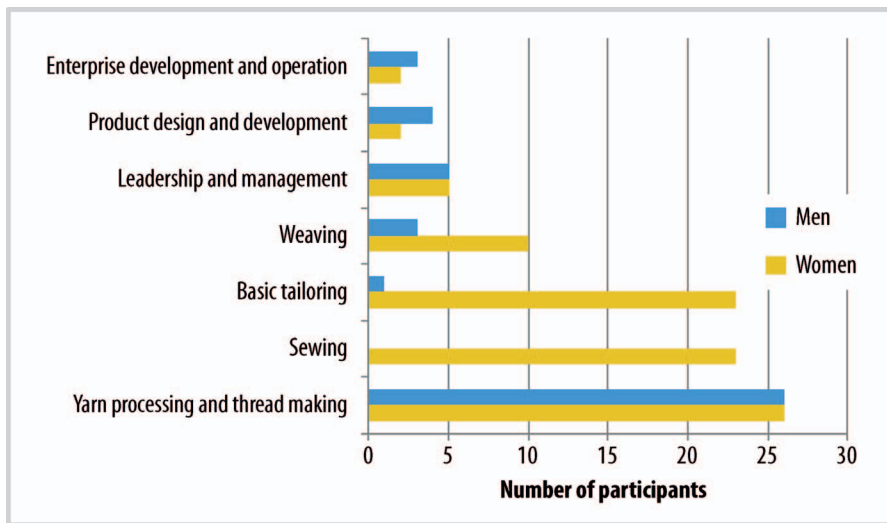


manufacturing and then promotes the *allo* products in high-end international markets. The BHPC started with 23 members in 2016; as of March 2017, its membership had grown to 82 members, including 69 women. In total, it lists 150 households as either members or indirect beneficiaries. With the completion of the project in December 2017, the BHPC was functioning independently with the help of the community members. One of the major outcomes of the project was the establishment of a new brand, Kailash—Truly Sacred, to promote local products. SABAH-Nepal has introduced a buyback guarantee scheme in the community through which the members of the BHPC can directly sell their entire produce to SABAH Nepal. Overall, the BHPC has reduced the cost of logistics, because members do not have to travel to sell their products; instead, the private sector entity buys them from the BHPC. The direct business link has also increased local residents' share in profits from the sale of *allo* and *allo* products by reducing the third-party involvement.

As a semiautonomous body of SABAH, the BHPC now serves as a key functional link in the *allo* value chain (Figure 2). Details of the approach used and the improvements introduced at different points along the chain are provided in ICIMOD (2015).

Impact assessment

The KSLCDI team evaluated the impact of the BHPC on the *allo* value chain, and particularly on women's lives,

FIGURE 3 Participation in skills training by gender.

using primary and secondary data collected as follows. Primary data were collected using an open-ended questionnaire survey targeting the female members of the BHPC in November 2016. Of the 82 BHPC members, 24 (30%) were randomly selected for interviews. Key topics in the survey included traditional uses of *allo* in Naugad, benefits of the enterprise setup, types of skills training the women had received and their impact on income generation, degree of involvement of women and other marginalized groups, and market linkages. The survey data were supplemented by key informant interviews and focus group discussions. For key informant interviews, factors such as age, sex, caste, and ethnicity were taken as important parameters for capturing the views and experiences of diverse social groups and deriving information from a social perspective. The interviews and discussions focused on the status of *allo* as an alternative

source of income before and after the *allo* value chain project.

The findings from the primary data collection were strengthened using secondary data, mostly from a review of journal articles, reports (published and unpublished), working papers, and conference proceedings. Microsoft Excel was used to carry out descriptive analysis, like deriving the percentages of women benefiting in different forms from the *allo* enterprise setup.

Results and discussion

Skills and trust development

A total of 15 training sessions were organized by SABAH-Nepal in 2016 and 2017 for BHPC members at the facility center in Naugad and in Kathmandu. The aim was to increase the number of women participating in the training for sewing, tailoring, and weaving, because these activities could be carried out at home and would help build entrepreneurial skills. Participation in the training sessions is shown by gender in Figure 3. Following the training, the number of women in Naugad who participated in thread-making skills increased by 23%. An additional 14% of women in Naugad developed their skills in knitting, and 31% developed sewing skills; 18% of women members were engaged in weaving *allo* fabrics for the first time in the community center (Figure 4). The buyback guarantee scheme encouraged women and marginalized groups to spend more time on *allo* activities, because it ensured their economic security. To increase understanding of the potential markets and demand-supply processes, 9 women and 4 men from the BHPC participated in 3 exposure trips—visits to trade fairs in the national capitals of India and Nepal. These trips helped to increase their knowledge of how they could add value to their products and increase their earnings.

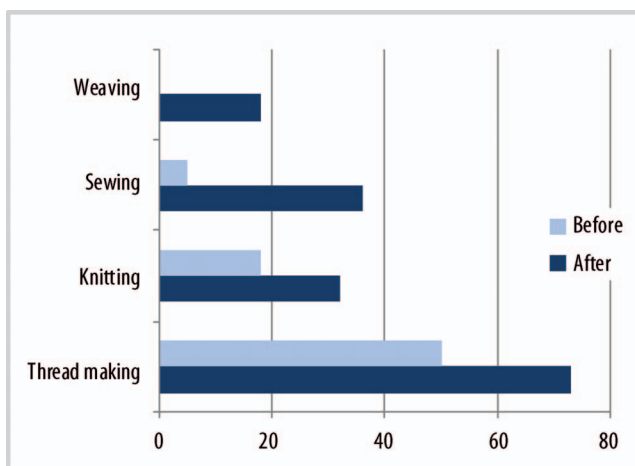
FIGURE 4 Women's participation in production activities before and after the project.

TABLE 1 Improvements in *allo* production and their impacts.

	Before the project (Oct–Nov 2014)	After the project (Nov 2015 onwards)	Impact
Harvesting technique	Uprooting	Cutting 8 cm above the ground	Ensured regrowth and sustainability of <i>allo</i> plants
Type of bark removed	Dry bark	Fresh green bark	Better yarn quality
Substance used to extract fiber	Caustic soda	Ash	Reduced water pollution; reduced health issues; organic product
Type of equipment used	Simple (eg hand spindles)	Modern (eg sewing machines and handlooms)	Increased efficiency; improved designs
Boiling technique	Traditional stoves	Energy-efficient rocket stoves	Reduction in fuelwood use; less tree felling; less smoke; reduced work time
Thread quality	Thick and uneven with much lint; wastage of around 200 g/kg	Thin, fine, even; wastage of less than 50 g/kg	Reduced wastage; thread compatible with handlooms and suitable for finer designs
Thread price^{a)}	NPR 250 per kg	NPR 1100 per kg	Increased income
Product design	Simple knits without refined design; limited range of items	Expanded product range in various styles, including river, brick, and fish-cut design	Increased demand for products; better prices

^{a)} US\$ 1 = NPR 103, June 2017.

A similar approach was taken in Bangladesh in 2012 by the Swedish fashion company KappAhl (BSR 2016). KappAhl worked in partnership with a local development nongovernmental organization (NGO) to open a training center in the town of Tongi. The aim was to provide economic opportunities in global value chains for poor women in the community. Women age 18–25 from poor households participated in a 3-month training program that included basic education (reading, writing, and arithmetic), as well as technical skills such as sewing. Around 500 women were trained and guaranteed a job at one of KappAhl's suppliers. Many of them went to work in factories and were able to earn an independent living for the first time. After the Rana Plaza Factory collapse in 2013, families worried about the safety of workers in such factories; because of traditional cultural norms, many fathers and husbands did not want female household members to work outside the home. However, the NGO adopted culturally sensitive awareness campaigns in communities and visited families in person to build trust. This in-person engagement proved important to gaining the support of family members, which is considered a key strategy for the program's success.

In value chain development, building trust is of utmost importance for the sustainability of the chain. This was addressed by KappAhl in Bangladesh; similarly, trust was maintained among the partners in the *allo* value chain development project in Naugad. In both cases, because of the training given to women, the mindset of the community has changed, and men have slowly started

allowing women to work outside their homes and earn money for themselves, even if it is just enough to fulfill limited household needs. One of the unexpected benefits was the creation of an informal network for some of the women, who made friends within the group and used the platform to share thoughts on common issues and support each other both inside and outside work.

Improved processing techniques and value addition

A number of improvements were introduced in the techniques for *allo* harvesting, processing, and value addition (Table 1). Among others, respondents noted that the new practice of making yarn from fresh green bark rather than dried bark improved yarn quality considerably, while the use of ash in place of caustic soda for extraction reduced negative health impacts like allergies, coughing, and gastritis and was more environmentally friendly. Previously, large amounts of caustic soda were used in processing to reduce the extraction time and generate finer fiber (Singh and Shrestha 1988), and the chemicals were washed into nearby rivers, polluting the water. The ash method enables production of chemical-free fiber, an organic product with a niche value in the international market.

As a part of developing and strengthening the *allo* value chain, considerable effort was put into technology transfer. In addition to training, modern equipment was provided to BHPC members to improve efficiency (Shah et al 2017). Survey respondents indicated that replacement of the traditional *katuwa* (hand spindle) with

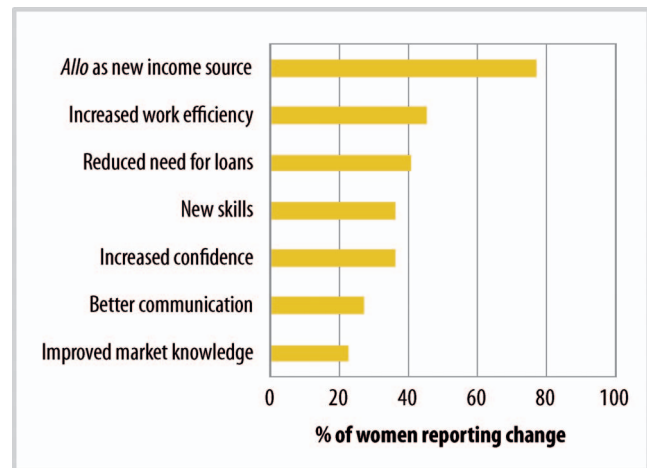
modern equipment had improved thread quality and increased income from *allo* by 27%. The introduction of energy-efficient rocket stoves (hot-burning stove using small-diameter fuelwood) to replace conventional stoves had reduced the amount of firewood needed to boil 30 kg of nettle bark by two-thirds, from 240 to 80 kg (ICIMOD 2016). Although a detailed analysis has not been conducted, according to almost all respondents, the fuelwood requirement for a rocket stove is easily met with twigs and dried bark from nearby fields, and the frequency of visits to forests to cut trees has decreased, in contrast with conventional stoves that require more and thicker fuelwood from the forest. Hence, the use of energy-efficient stoves has helped to reduce tree felling, excessive smoke emission, and indoor air pollution. Cooking time per batch was reduced by 45 minutes, providing relief to women from household chores and allowing them to spend more time on childcare and income-generating activities.

Socioeconomic transformation, especially for women

Small and medium enterprises are particularly important in developing countries because of their potential for entrepreneurship development and employment generation (Cook 2000), and Nepal's government policies have recognized the potential of such enterprises to contribute to poverty reduction (Kunar et al 2009). However, in traditional societies, normalized gender discrimination and attitudes about behavior in the public arena often limit women's ability to take advantage of economic opportunities (Kabeer 2012). The lives of women are generally more precarious than those of men in terms of access to resources and income-earning opportunities, as well as quality of life and wellbeing (Seddon and Hussein 2002; Acharya et al 2007). Although lack of income affects all members of a family, the human impact of poverty tends to affect women and children disproportionately (Sawhill 1988; Wood 2003; Acharya et al 2007). Research conducted in countries like Bangladesh, Brazil, Kenya, and South Africa has indicated that globally, financially independent women have more control over income expenditure, which results in improved health and education for children and has a positive impact on development (United Nations 2009). Thus, there is growing recognition of the importance of promoting women as business leaders, which is also true of the *allo* value chain development in Naugad, as discussed later.

Allo collectors in Nepal are mostly women from poor families with little access to financial resources, and their contribution to the value chain is rarely recognized (Gurung et al 2012; ICIMOD 2015) in terms of remuneration by the actors involved in the chain. In Naugad, a focused effort was made to include women and other people from marginalized groups as important

FIGURE 5 Socioeconomic impact of improvements in the *allo* value chain.



actors in the value chain. The training and exposure visits helped them build their capacity and take a leading role in the value chain. Women noted that they had considerably increased their skills in thread-making, sewing, and weaving following the training (Figure 4) and could now produce diversified products such as bags, purses, suits, cushion covers, scarves, shawls, pot holders, and runners. This had led to an increased demand for their products in the market.

One of the most important impacts of the *allo* project was the perception (by 77% of survey respondents) of *allo* as a new source of income (Figure 5). BHPC members reported earning NPR 3000–4000 per month, ie NPR 130 per day on average from sewing, which compares favorably with the average daily labor wage in the community of NPR 100. In the past, social and cultural norms in Naugad limited the participation of women in mainstream development activities. However, there has been increasing acceptance of women's leadership since *allo* value chain development began in Naugad in 2015, and women are now considered important actors in the chain. People in Naugad have received various skills and leadership training irrespective of their age, caste, religion, or ethnicity and are producing a variety of nettle fiber products. Women who were previously dependent on their husbands for cash resources now contribute to the family income. The cost of general household items like soap, butter, and sugar (NPR 3000–5000 per month) is covered by the income generated through *allo*. The BHPC also serves as an enabling workspace where women and members of other marginalized groups work together to address issues related to personal and community wellbeing. Enterprise-related decision-making is now entrusted to women.

The success of the BHPC has encouraged entrepreneurs to develop small businesses at all points along the *allo* value chain. More than 25 women entrepreneurs were identified in Naugad with *allo*-based

microbusinesses, from home production of thread to tailor shops using *allo* and other fabrics and even exploring cross-border sales options in India. As of December 2017, 36 women were employed at BHPC making value-added products.

A study conducted by ICIMOD (2015) reported an annual income of NPR 35,000 for a woman who had been working on *allo* for the last 15 years in Naugad. It reported that she collected 500–800 kg of *allo* every year from the forest and sold semiprocessed bark at the district headquarters. She also produced about 200 thick threads for use with livestock and for the production of *damlo* (rope to carry loads) and sold them at a rate of NPR 200 each until 2016. The same woman in the survey reported that with improved skills at BHPC, she is now able to sell fine *allo* thread instead of semiprocessed bark, thus earning more.

Another woman member of BHPC reported that her increased skills in producing finer *allo* threads and in sewing and weaving *allo* products (ICIMOD 2016), after receiving the training in 2016, had established her as an entrepreneur in Naugad, making her financially stronger and more independent than in 2014. The income generated by these women entrepreneurs has helped them cover household expenses and invest more in the education and welfare of their children (Subedee et al 2017).

A study conducted by Action Aid in 2014 in Palestine (Morioka and Nicholas 2014) showed similar results. Before participation in Action Aid's savings and loans groups, women did sewing, knitting, and weaving in isolation and mostly for friends and acquaintances. They had limited capacity to negotiate prices with suppliers for raw materials, were inhibited by expectations about appropriate behavior for women interacting with men outside the family, and operated only as processors, depending on others for sales and with little incentive to improve or upgrade. The women selected embroidery, vine leaf packaging, and loofah production as livelihood activities, and the program gave them the knowledge, skills, and confidence to add value to their work. The project eased their financial situation and helped them meet other women and overcome their isolation, as well as providing a much-valued opportunity to learn skills for production and managing an economic venture.

Another successful project took place in Sri Lanka: the 3-year Dairy Enhancement in Eastern Province program, launched in 2009 by Land O'Lakes International Development, the US Agency for International Development, and CIC Agri Business, a Sri Lankan dairy company (Steensland 2014). The program was designed to introduce improved technologies and link smallholder farmers to commercial markets, with the goal of increasing farmers' incomes by 75%. It also helped women move beyond irregular informal sales by developing a market-driven link to a private-sector processor willing to

provide a higher farm-gate price. Today, CIC Agri Business is selling 50,000 cups of yogurt and 15,000 small packets of milk for children per day around Sri Lanka, providing a good example of successful scaling up.

Scalability and sustainability of the value chain

In value chain development, scaling up aims to extend long-term benefits to more beneficiaries by ensuring sustainability and providing additional resources and expertise (IFAD 2015), locally or over a larger area. Scaling up generally requires an organized group to ensure that integration in the value chain is viable and sustainable and that there is a regular supply of produce in sufficient quantity, which further improves bargaining power when interacting with private-sector actors along the chain (IFAD 2015; IFPRI 2016).

In Naugad, after the project intervention, BHPC members continued working together to maintain the supply of *allo* items required by the private sector. Using their improved skills, community members have started to produce high-quality items. The involvement of actors in the *allo* value chain in Naugad starts with the collection of *allo* bark from forests and ends with the export of value-added products by SABAH Nepal. Value addition occurs at 3 levels: first, by BHPC members in Naugad; second, at the district capital of Darchula by the traders from Naugad who travel there; and finally, at SABAH Nepal's facility in Kathmandu. After that, the products are either sold in SABAH Nepal's outlets in Kathmandu or exported. The income generated by selling *allo* products is shared by rural communities and urban entrepreneurs to ensure equitable benefit sharing among actors in the chain and to ensure the sustainability of the chain.

SABAH Nepal has expanded the idea of branding and collective production to other mountain commodities beyond *allo*. The Kailash–Truly Sacred brand now includes kidney beans, vegetables, dairy products, and medicinal plants from Nepal, as well as *churia* honey from India. This has led to the adoption of a basket approach that considers a variety of other products in the value chain besides *allo*, which has contributed to business diversification of the people of Naugad. The Naugad community has been able to make a barter agreement with SABAH Nepal to minimize the risks of a shortage of *allo* and maintain the business through the supply of other products available in the area. The project has helped community members improve their bargaining skills and enabled them to negotiate equitable prices for their products and thus sustain their businesses. In total, 6 national and international market linkages have been established by the *allo* producers, including a 3-star hotel in Kathmandu and buyers in India, Japan, and Norway. *Allo* is supplied in different forms depending on demand. These networks were established when community

members participated in the trade fairs in Kathmandu and New Delhi.

As mentioned in the introduction, the textile industry worldwide is looking for alternative sources of natural fiber to reduce dependence on cotton and silk (Radhakrishnan and Preeti 2015). In Uttarakhand in India, *van panchayat* user groups (community-based forest management groups), started cultivating nettle fiber after realizing its potential to ensure secure alternative livelihood options (Radhakrishnan and Preeti 2015; Debnath et al 2017). *Allo* is widely distributed in subtropical to temperate areas across the Himalayan region, including Bhutan, China, India, Myanmar, and Nepal (Singh and Shrestha 1985, 1988; Radhakrishnan and Preeti 2015; Debnath et al 2017). Considering the resource availability and growing interest of local communities, the community-owned enterprise model introduced in far west Nepal has the potential for extension not only to other parts of Nepal but also to neighboring areas in Bhutan, China, and India. However, before promoting the approach, it is important to conduct a preliminary study of local conditions, as was the case before the project described here (ICIMOD 2017). This analysis found that although *allo* is a high-value product with substantial scope for value addition within the community, there is a risk of inadequate quality control, which may lead to difficulties in competing in international markets. In addition, the production of *allo* fiber at the local level is not cost effective, and because of the limited technology for and tedious nature of *allo* extraction, processing, and

thread-making, *allo*-based entrepreneurs may lose interest, even though nettle products are emerging as one of the most important souvenir items in the tourist trade. Such findings need to be taken into account in developing a value chain project.

Conclusion

The *allo* value chain development in Naugad demonstrated a successful model for women's empowerment through collective action. Local women have become active members of the *allo* enterprise and are increasing financial security at the household level by selling *allo* products in different forms. The project identified good practices using environmentally friendly and energy-efficient technologies and methods that minimize the use of external inputs such as chemicals and fuelwood. The project produced the following lessons:

1. An orchestrated effort targeting training, skills development, exposure visits, and women's active participation is important for promoting inclusive development of a value chain.
2. Enterprises based on natural resources like *allo* require sound ecosystem management to ensure sustainability.
3. Partnership with a private-sector entity that considers social and environmental values, as well as economic gains, is key for value chain promotion in a remote landscape.

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REFERENCES

- Acharya S, Yoshino E, Jimba M, Wakai, S. 2007. Empowering rural women through a community development approach in Nepal. *Community Development Journal* 42(1):34–46. doi:10.1093/cdj/bsi064.
- Barakoti TP, Shrestha KP. 2009. Commercial utilization of *allo* (*Girardinia diversifolia*) by the Rais of Sankhuwasabha for income generation. *Banko Janakari* 18(1):18–24. doi:10.3126/banko.v18i1.2162.
- Bhattarai B, Leduc B, Choudhary D, Pandit BH. 2010. *Engendering the Value Chain: The Case of Community Based Bay Leaf Enterprise in Nepal*. Kathmandu, Nepal: International Centre for Integrated Mountain Development.
- BSR [Business for a Better World]. 2016. *Women's Empowerment in Global Value Chains: A Framework for Business Action to Advance Women's Health, Rights, and Wellbeing*. Copenhagen, Denmark: BSR. <https://www.bsr.org/reports/BSR-Report-Womens-Empowerment-Supply-Chains.pdf>; accessed on 9 October 2017.
- Clarke RC. 2007. Traditional Nepali hemp textiles. *Journal of Industrial Hemp* 12(2):97–113. doi:10.1300/J237v12n02_07.
- Cook P. 2000. *Finance and Small and Medium Sized Enterprise Development*. Finance and Development Research Programme Working Paper Series. Manchester, United Kingdom: Institute for Development Policy and Management, University of Manchester.
- Debnath K, Singh I, Divedi A. 2017. On the analysis of force during secondary processing of natural fiber-reinforced composite laminates. *Polymer Composites* 38(1):164–174. doi:10.1002/pc.23572.
- Duthie JF. 1960. *Flora of the Upper Gangetic Plain and of the Adjacent Siwalik and Sub-Himalayan Tracts*. Calcutta, India: Superintendent of Government Printing.
- GIZ [German Corporation for International Cooperation]. 2013. *Value Chain Development by the Private Sector in Africa: Lessons Learnt and Guidance Notes*. Bonn, Germany: GIZ. <http://www.plugintheworld.com/mobisol/wp-content/uploads/2014/01/Value-chain-development-by-the-private-sector-in-Africa.pdf>; accessed on 10 October 2017.
- Gurung A, Flanigan H, Ghimeray AK, Karki R, Bista R, Gurung OM. 2012. Traditional knowledge of processing and use of the Himalayan giant nettle (*Girardinia diversifolia* [Link] Friis) among the Gurungs of Sikles, Nepal. *Ethnobotany Research and Applications* 10:167–174. doi:10.17348/era.10.0.167-174.
- Hoermann B, Choudhary D, Kollmair M. 2010. *Integrated Value Chain Development as a Tool for Poverty Alleviation in Rural Mountain Areas: An Analytical and Strategic Framework*. Kathmandu, Nepal: International Centre for Integrated Mountain Development. http://lib.icimod.org/record/8058/files/attachment_703.pdf; accessed on 10 October 2017.

- ICIMOD [International Centre for Integrated Mountain Development]**. 2015. Promotion of the Allo (Himalayan Nettle) Value Chain in Nepal: Sustainable Livelihoods in the Kailash Sacred Landscape. Kathmandu, Nepal: ICIMOD. http://lib.icimod.org/record/31164/files/Allo_15.pdf; accessed on 10 August 2017.
- ICIMOD [International Centre for Integrated Mountain Development]**. 2016. Fabric for Future: Women Entrepreneurs Building Better Livelihoods Through Allo Production in Far-western Nepal. Kathmandu, Nepal: ICIMOD.
- ICIMOD [International Centre for Integrated Mountain Development]**. 2017. Greening Allo Value-Chain in Darchula, Nepal: A Process Documentation. Kathmandu, Nepal: ICIMOD. Unpublished report. Available from corresponding author of this article.
- IFAD [International Fund for Agricultural Development]**. 2015. Sustainable Inclusion of Smallholders in Agricultural Value Chains: Scaling Up Note. <http://www.ifad.org/documents/10180/77b9f80c-038e-4596-a6a1-10596555975b>; accessed on 12 October 2017.
- IFPRI [International Food Policy Research Institute]**. 2016. Innovations for Inclusive Value Chain Development: Successes and Challenges. Washington, DC: International Food Policy Research Institute. <http://dx.doi.org/10.2499/9780896292130>; accessed 10 October 2017.
- Joshi SR, Rasul G, Shrestha Joshi A**. 2016. Pro-poor and Climate Resilient Value Chain Development: An Operational Guidelines for the Hindu Kush Himalayas. ICIMOD Working paper 2016/1 Kathmandu, Nepal: International Centre for Integrated Mountain Development.
- Kabeer N**. 2012. Women's Economic Empowerment and Inclusive Growth: Labour Markets and Enterprise Development. Discussion Paper 29. London, United Kingdom: Centre for Development Policy & Research, School of Oriental & African Studies, University of London.
- Kaplinsky R, Morris M**. 2001. A Handbook for Value-Chain Research. Gapresearch.org, IDS, United Kingdom. <http://www.ids.ac.uk/ids/global/pdfs/VchNov01.pdf>; accessed on 1 October 2017.
- Kunar SC, Ansari AS, Luintel H**. 2009. Non-timber forest products enterprise development: Regulatory challenges in the Koshi Hills of Nepal. *Journal of Forest and Livelihood* 8(2):39–50. doi:10.3126/jfl.v8i2.2307.
- Lanzilao G, Goswami P, Blackburn RS**. 2016. Study of the morphological characteristics and physical properties of Himalayan giant nettle (*Girardinia diversifolia* L.) fibre in comparison with European nettle (*Urtica dioica* L.) fibre. *Materials Letters* 181:200–203. doi:10.1016/j.matlet.2016.06.044.
- MEDEP [Micro-Enterprise Development Programme]**. 2010. Value Chain Based Approach to Micro-enterprise Development. Value Chain Analysis: Allo. Value Chain Series 1. Bakhundole, Lalitpur: MEDEP. <http://medep.org.np/epanel/publication/docs/Value%20Chain%20Analysis.pdf>; accessed on 28 September 2017.
- Mitchell I, Keane J, Coles C**. 2009. Trading Up: How a Value Chain Approach Can Benefit the Rural Poor. London, United Kingdom: Overseas Development Institute. <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/5656.pdf>; accessed on 17 January 2018.
- Morioka K, Nicholas G**. 2014. Women Empowerment and Value Chains: Experiences of Women in Cambodia, Palestine and Uganda. Camperdown, Australia: Action Aid. https://acfid.asn.au/sites/site.acfid/files/resource_document/WEVC%20report%20.%20fnl.pdf; accessed on 12 October 2017.
- Negi CS**. 2007. Changing face of polyculture in the Darma and Johaar valleys, Pithoragarh, Kumaun Himalayas. *International Journal of Sustainable Development and World Ecology* 14(4):428–436. doi:10.1080/13504500709469743.
- NHPC [Nepal Health Professional Council]**. 2011. Nepal Population. Kathmandu, Nepal: NHPC.
- OECD [Organization for Economic Co-operation and Development]**. 2009. Promoting Pro-poor Growth: Private Sector Development. Paris, France: OECD. <http://www.oecd.org/development/povertyreduction/43514563.pdf>; accessed on 2 September 2017.
- OECD/WTO [Organization for Economic Co-operation and Development and World Trade Organization]**. 2015. Aid for Trade at a Glance 2015: Reducing Trade Costs for Inclusive, Sustainable Growth. Paris, France: OECD. https://www.wto.org/english/res_e/booksp_e/aid4trade15_chap8_e.pdf; accessed on 8 January 2018.
- Pant B, Rai RK, Wallrapp C, Ghate R, Shrestha UB, Ram A**. 2017. Horizontal integration of multiple institutions: Solutions for yarshagumba related conflict in the Himalayan region of Nepal? *International Journal of the Commons* 11(1):1–23. doi:10.18352/ijc.717.
- Pyakurel D, Baniya A**. 2011. NTFPs: Impetus for Conservation and Livelihood Support in Nepal. A Reference Book on Ecology, Conservation, Product Development, and Economic Analysis of Selected NTFPs of Langtang Area in the Sacred Himalayan Landscape. Kathmandu, Nepal: World Wide Fund For Nature (WWF).
- Radhakrishnan S, Preeti A**. 2015. Development of fabric from *Girardinia diversifolia* stem fibres and its blends. *International Journal of Innovative Research in Science, Engineering and Technology* 4(11):10,499–10,506. doi:10.15680/IJRSET.2015.0411023.
- Rasul G, Hussain A, Sutter A, Dangol N, Sharma E**. 2016. Towards an Integrated Approach to Nutrition Security in the Hindu Kush Himalayan Region. ICIMOD Working Paper 2016/7. Kathmandu, Nepal: International Centre for Integrated Mountain Development.
- Sawhill IV**. 1988. Poverty in the US: Why is it so persistent? *Journal of Economic Literature* 26(3):1073–1119.
- Seddon D, Hussein K**. 2002. The Consequences of Conflict: Livelihoods and Development in Nepal. Overseas Development Institute Working Paper 185. London, United Kingdom: Overseas Development Institute. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.509.2760&rep=rep1&type=pdf>; accessed on 10 October 2017.
- Shah G, Khadka M, Ahmad F, Budhathoki N, Shrestha A**. 2017. Assessment of Himalayan nettle (*Girardinia diversifolia*) value chain development interventions: Evidence from rural households in the far western Nepal. *Journal of Agriculture Science* 9(5):19–32.
- Sharma JR**. 2011. Culture of migration in the middle hills of Nepal. In: ICIMOD [International Centre for Integrated Mountain Development], editor. *Labour Migration. Opportunities and Challenges for Mountain Livelihoods*. Kathmandu, Nepal: ICIMOD, pp 18–20.
- Shrestha R**. 1997. Cytological studies in *Girardinia diversifolia* (Link.) Friis. *Pakistan Journal of Botany* 29(2):263–269.
- Shrestha UB, Bawa KS**. 2013. Trade, harvest, and conservation of caterpillar fungus (*Ophiocordyceps sinensis*) in the Himalayas. *Biological Conservation* 159:514–520.
- Singh SC, Shrestha RR**. 1985. A Study of Himalayan Nettle. Kathmandu, Nepal: Research Center for Applied Science and Technology, Tribhuvan University.
- Singh SC, Shrestha RR**. 1988. *Girardinia diversifolia* (Urticaceae), a non-conventional fiber resource in Nepal. *Economic Botany* 42(3):445–447.
- Singh SC, Shrestha RR**. 1989. Observations on ecodemes in *Girardinia diversifolia* (Link.) Friis, Urticaceae in Nepal. *Pakistan Journal of Botany* 21(1):185–190.
- Steensland S**. 2014. Productive dairy value chain improves lives of women in Sri Lanka. Global Harvest Initiative. <http://www.globalharvestinitiative.org/index.php/2014/03/productive-dairy-value-chain-improves-lives-of-women-in-sri-lanka/>; accessed on 12 October 2017.
- Subedee BR, Chaudhary RP, Dorji T, Shrestha AJ**. 2017. Indigenous and local knowledge of conservation and sustainable use of Himalayan Giant Nettle (*Girardinia diversifolia* [Link] Friis) in eastern and far-western regions of Nepal. In: Roué M, Molnár Z, editors. *Knowing Our Lands and Resources: Indigenous and Local Knowledge and Practices Related to Biodiversity and Ecosystem Services in Asia*. Paris, France: UNESCO [United Nations Educational, Scientific and Cultural Organization], pp 191–198.
- TEPC [Trade and Export Promotion Centre]**. 2014. Foreign trade statistics of Nepal [First eleven months (Shrawan-Jestha) of Fiscal Year 2070–71]. Kathmandu, Nepal.
- United Nations**. 2009. The global financial crisis: Assessing vulnerability for women and children, identifying policy responses. Paper Presented at the 53rd Session of the Commission on the Status of Women. New York, NY, 2–13 March. http://www.un.org/womenwatch/daw/csw/csw53/panels/financial_crisis/Buvinic.formatted.pdf; accessed on 8 October 2017.
- USAID [United States Agency for International Development]**. n.d. Gender and Pro-poor Value Chain Analysis: Insights From the Gate Project Methodology and Case Studies. http://www.microlinks.org/sites/microlinks/files/group/resource/files/GATE_Gender_Pro-Poor_Value_Chain_Analysis_05-09.pdf; accessed on 8 October 2017.
- Wood D**. 2003. Effect of child and family poverty on child health in the United States. *Pediatrics* 112(3):707–711.
- World Bank**. 2014. Expanding Women's Access to Financial Services. <http://www.worldbank.org/en/results/2013/04/01/banking-on-women-extending-womens-access-to-financial-services>; accessed on 12 December 2017.