Why so few expert women in the water sector? Masculinity, race, sex, and policy narratives of technology, gender and development in Nepal

Janwillem Liebrand*

International Development Studies, Department of Human Geography and Spatial Planning, Faculty of Geosciences, Utrecht University, Utrecht, Netherlands

To challenge the masculinity of the professional water sector, I take in this paper one of the core questions of feminist technology studies as the starting point: why are there so few expert women in technology? By means of a critical feminist reading of policy and research documents, from the 1950s onwards, focusing on Nepal's history of rural development and technology transfer, I trace the origins of expert women's limited participation in politically relevant processes of water decision making. The analysis reveals that both technology-and-development—and women/gender-and-development policy narratives have validated, and continue to validate, women expert's subordinate position in the Nepali water sector. This is partially so, because donors and national governments insufficiently recognize the racial and sexist assumptions that are historically rooted into these policy narratives.

KEYWORDS

Nepal, water sector, technology, gender, race, development, engineering, feminism

1. Introduction

To challenge an enduring masculinity in the professional water sector in so-called developing countries (Zwarteveen, 2008, 2011; Liebrand and Udas, 2017; Shrestha et al., 2019; Liebrand, 2022), I take in this article one of the core questions of feminist technology studies as the starting point (Lohan and Faulkner, 2004): why are there so few expert women in technology? The focus is on Nepal. Comparable to other countries in the South, Nepal was inserted in the global capitalist system in the 1950s through "development", and "planned development" took over where colonialism left off (Tamang, 2002; Whelpton, 2005; Power, 2006).[1] Hereby, the focus of donors was on the transfer of technology, from the West to the developing world, and in turn, from experts to users (Guthman, 1997). And parallel, and often integral, to technology adoption narratives, development agendas were inspired by Western-conceived women/gender empowerment narratives (Rathgeber, 1990; Mcilwaine and Datta, 2003).

Broadly, this meant in Nepal that foreign advisers, from the US, Europe and elsewhere, with the introduction of modern science and technology in the 1950s and 1960s, also introduced new ideas on the modern roles for men and women, bringing a focus on "home science" and "women's training" in technology transfer (Skerry et al., 1992). Like elsewhere, these ideas were followed up in Nepal in the 1970s, 1980s and 1990s with "women development policies" and "gender development policies" (Acharya and Bennett, 1981; Acharya, 2001), reflecting, liberal-feminist and socialist-feminist narratives of Women

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1 Nepal was never colonialized but its foreign policy was dictated by the British in India (Whelpton, 2005).

in Development (WID) and Gender and Development (GAD) respectively (Rathgeber, 1990). And since the 2000s and 2010s, Nepal's discussions on "gender mainstreaming" reflect global ideas on human rights and racial discrimination, inspired by treaties such as the UN Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (Acharya, 2001), and the International Convention on the Elimination of All Forms of Discrimination (ICERD) which, since 2009, has included Dalit's exclusion as a form of "descent-based" and "caste-based" discrimination, and thus, activist-proponents argue, as a form of "racial" discrimination (Bennett et al., 2012).[2]

Yet, in the spite of the conceptual shifts in policy—from "women" to "gender", from "gender mainstreaming" to "social inclusion"—the overall result is disappointing. On the ground, many Nepali women users from marginalized ethnic groups continue to live without access to water supply services (Bennett et al., 2012; Meierhofer et al., 2022) and in the office, Nepali expert women hardly participate in politically relevant processes of water-decision making (Udas and Zwarteveen, 2010; Liebrand, 2022). Long-time scholars on Nepal point out that Nepal lacks a broad-based feminist movement (Bennett, 2017; Gyawali, 2022), and they connect it to the implementation of women and gender development policies in Nepal, and the habit of donors and governments to focus on the promotion of these policies, instead of explicitly seeking to support and build on grassroots activism in Nepal. They point out, for instance, that the involvement of upper-caste women in Hindu religious reforms in the first half of the 20th century in Nepal, seeking to abolish the *sati* system (Nepali and Nepali, 2019), was perhaps known to Western advisors but not considered by them as a stepping stone to re-invigorate development.[3] And later, they point out, Nepal's incipient women's rights movements were cobbled up in what the historian Arnold Toynbee would call Western mimesis: the Marxist, class-based in the 1970s, the neo-liberal NGO-based in the 1990s, the post-modern approach moving beyond those two ideological ones in the 2010s, and the most recent anti-masculine version embracing LGBTQ rights as well (Gyawali, 2022). As a result of this, they observe, many women's organizations in Nepal lack a basic feminist ideology, and educated members of the elite—and expert women in water belong to this group—feel ambivalent about gender, caste and ethnic hierarchies in Nepal which they see as incompatible with

their own modern democratic ideals of equality between citizens (Bennett, 2017).

In thinking about a new feminist water politics and ways to disrupt the bond between technology and masculinity, in this case in Nepal, feminist technology studies offers two strands of analysis: women *and* technology, and women *in* technology (Lohan and Faulkner, 2004; Wajcman, 2010). The first one traditionally receives most attention in development studies, and focuses on how technology connects to women users and why it often "fails" to reach them (see on gender and water in Nepal: Bruins and Heijmans, 1993; Zwarteveen and Neupane, 1996; van Koppen et al., 2001; Ghimire, 2004; Upadhyay, 2004; Udas, 2014). In the liberal tradition of global development cooperation, these studies mostly have been policy-inspired evaluations and somewhat problematically, they tend to focus on women rather than technology and/or men. This means that they tend to be either overtly techno-optimist or occasionally techno-pessimist, with the latter portraying women as victims of men's modern technology at best (see for an overview of the discussion: Lohan and Faulkner, 2004).

In an attempt to reverse the gaze in the water sector and shift the focus to the *co-production of knowledge on technology and gender*, I take inspiration from the strand that has received much less attention in development studies, and focuses on the question why are there so few expert women in technology (Lohan and Faulkner, 2004; Wajcman, 2010). In development studies, in relation to the water sector, Lynch (1993) was one of the first to shift the focus to an entrenched culture of male hegemony in irrigation bureaucracies. This and later work in development (Zwarteveen, 2008; Udas and Zwarteveen, 2010; Ongsakul et al., 2012; Shrestha et al., 2019; Liebrand, 2022) shows how male dominance in water engineering is sustained in part by a cultural marking of technology as masculine and white, and brings with it a masculine culture that is inimical to women's progression within the occupation, similar to how it occurs in the West (Håpnes and Rasmussen, 1991; McIlwee and Robinson, 1992). Building on this work, further research in this field can shed a fresh light on the question why the promotion of technology in Nepal, and decades of gender mainstreaming in the water sector, has not produced more equal social relations in society, and why it has not resulted in the active participation of Nepali expert women in water decision making.

2. Conceptual entry points and method of analysis

The conceptual starting point in this article is that planned development took off, where colonialism left off (Power, 2006). Saliently, this point is receiving insufficient attention in talks on a new feminist water politics. Water experts and scholars are accustomed to considering questions of gender in relation to technology, talking about the inclusion of women in water projects, and there is some consideration of the problem of men and masculinities in the water sector, but it is taken for granted that the ethnic-racial fictions of European imperialists belong to the past and speaking about race in water is considered irrelevant and harmful at best (cf. White, 2002; Kothari, 2006a,b). This is remarkable because under Western eyes, deep into the 20th

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2 By law, caste discrimination in Nepal is illegal since 1963, but in practice, caste divisions are still visible in society. Dalits (downtrodden) are seen as occupying a place below the traditional caste hierarchy in Nepal and they are treated as so-called impure or untouchable groups (Gurung, 2006).

3 The question of *sati* (widow burning) received considerable attention during British-Indian colonial rule, both from British observers and Indian social reformers. In fact, widow burning was first problematized in Bengali society with the coming of British colonial rule in the 1820s and 1830s, and the widow and her plight remained a subject of central importance in Bengali novels between the 1870s and 1920s, and an important aspect of modern critiques of Bengali kinship. The "widow" was thus one of the first subjects of enlightenment in British-India, exemplary for the British colonial discourse of using the "condition of women" as an index for measuring the quality of a civilization (see for an overview of the argument: Chakrabarty, 2008, p. 117–148).

century, *race* was the dominant framework to conceive and classify the people in the world in the global hierarchy of civilization (Mohanty, 1984; Thomas, 1998). More specifically, the idea of "race" as a particular way through which the West distinguished itself from the "others" was tied in the 19th century to the new importance given to biological difference to justify men's dominance over women (Andermahr et al., 1997), and historians have argued that scientific classifications of race and sex in the West have long been associated with each other, meaning that so-called lower races provided a metaphor for the female type of humankind and females a metaphor for the "lower race" of gender (Stepan, 1993).

Western feminists remind us that Western culture is still based on a strong race/sex/gender connection (Markowitz, 2001), as exemplified by norms of heteronormativity and hegemonic masculinity (Connell and Messerschmidt, 2005), and there is reason to assume that it is (also) still "at work" in development. Race scholars point out that differences in race in the beginning of the 1920s in the US came to be couched in cultural and social terms instead of, or simultaneously with, biological ones, and that a new set of concepts gained currency, displacing "race" with the notion of "ethnicity" as a descriptor of difference (Omi and Winant, 1986). In the case of South Asia, the British left the subcontinent more than 70 years ago, and colonial racist policies were legally abolished even earlier, but postcolonial scholars argue that terms like "tribal", "native", "indigenous", "minority", "ethnicity", "caste" and "culture" *de facto* continue to serve as stand in for "race" because they confirm the idea of cultural difference in development (Cooper, 1996; White, 2006). In this view, the use of the concept "ethnicity" by anthropologists in the postcolonial world of international development cooperation is thus a reflection of the shifting discourses on race in the West, and it can be expected that an implicit scale of racially coded degrees of sex/gender difference is still at work in development, culminating in the manly white man and feminine white woman,; the sharper the contrast, the more advanced a society is (cf. Markowitz, 2001). In Nepal, for instance, the social identities of "engineer" and "lady engineer", as they exist in the Department of Irrigation (Liebrand and Udas, 2017), reveal the working of such racially coded sex/gender degrees. It is the manly engineer and the womanly lady engineer that help the "educated" upper-castes (Bahun, Chhetri, Newar) to accentuate their "advancement" vis-à-vis the "underdevelopment" of the lower classes (especially in relation to ethnic groups and so-called Dalits).[4]

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4 Traditionally, the Nepali caste division diverges from the four-fold *varna* (social order) model in India, which has four occupational categories: (i) Brahmin priests (Bahun); (ii) Kshatriya warriors (Chhetri); (iii) Vaisya farmers and traders; and (iv) Sudra laborers. Instead, the Nepali version has five categories to accommodate the "tribal" or "ethnic" groups, such as the Gurung, Tamang, Limbu and Sherpa. In addition, there are the Newars, people with origins in the Kathmandu Valley, and the Madhesis, people with origins in the Tarai, the plains that border India. Both the Newar and Madhesi people have different castes spanning the entire range from upper-caste to lower-caste tiers. The Madhesi people also include a Muslim minority (Höfer, 2004; Gellner et al., 2008).

In Nepal, the start of planned development played a particularly significant role in the formation of the race/sex/gender connection. Unlike other parts of South Asia, Nepal never fell directly under administration of the British colonial government in India, and the country remained closed for foreigners until 1951 when the Rana dynasty fell and the new government adopted democracy (Whelpton, 2005). With the introduction of modern science and technical expertise in Nepal in the early 1950s, foreign advisers, basically from scratch, also introduced new ideas on the roles for "men" and "women". It followed the validation of two non-integrated streams of development thinking; the humanities and social sciences on the one hand, and the applied technical and engineering disciplines on the other (Ensminger, 1966; Staples, 1992). The latter included fields such as agricultural sciences and infrastructure development. This dichotomy of thought was marked by a hierarchically gendered "horizontal segregation" in science, meaning that expert men occupied the technical and engineering disciplines, and expert women were concentrated in the less-valued areas such as social sciences (Gupta, 2007, p. 511; Nair, 2012). With the introduction of planned development, a system of horizontal segregation and gendered discrimination thus came with it, meaning that foreign agents validated the division of men/women as the hegemonic social dichotomy in nation building (Tamang, 2002). Before that time, social relations between various groups in Nepal, and between men and women of these groups, had been based on a caste-based moral order, enforced by the state (Höfer, 2004). In this order, the conceptualization of separate homogeneous groups of "Nepali men" and "Nepali women" was not possible.

In this process, I noted above, foreign agents did not seek connections with existing networks of feminist activism in Nepal, notably the involvement of Nepali women in Hindu religious reforms in the early 20th century. Seeking to introduce liberal and rational values from the West, they saw Hindu regulations and caste practices as "backward" and "traditional", and they conceptualized the Nepali population as a relatively homogenous, poor and uneducated group of people who would be better off adopting science-based knowledge and modern behavioral patterns and attitudes (Donner, 1966). Put simply, existing social divisions along class and caste lines in Nepal were ignored or had to be overcome by creating development opportunities. A gender-specific differentiation, apart from an implicit racist one, was locked in this view. "Native" men in Nepal were supposed to learn about agriculture and new technologies, and "native" women in Nepal about the latest insights in modern nutrition, health care and sanitation. The latter was known as the field of "home science" or "home economics", a science discipline that came from the US (Axinn, 1988; Sachs, 1996).

In the professional domain of planned development, men have thus historically occupied the fields of engineering and technical expertise. The water sector in South Asia is exemplary. There, dating from colonial times, water resources development has been managed as a field of irrigation engineering (Gilmartin, 1994), and today, the dominant presence of men in water resources engineering in South Asia continues to produce particular norms of masculinity in society (Zwarteveen, 2011; Liebrand and Udas, 2017). And vice versa, norms of masculinity in South Asia help bring about a gendered profession in engineering and water

resources development, making it normal for men to be an engineer. As a result, employment prospect in the South Asian region in engineering have never been encouraging for women (Nair, 2012). This is particularly true for the public sector that governs water resources development (Parikh and Sukatme, 1994; Adhikary, 1995; Parikh and Sukhatme, 2004; SaciWaters, 2011). Meanwhile however, in India and Nepal, there has been a 50-fold increase in engineering education in the period from the 1950s to the 2010s, a trend that has increased both male and female student enrolment (Parikh and Sukhatme, 2004; Liebrand, 2022). The problem of female underrepresentation in engineering in South Asia can thus now be considered acute and contested, because there is now a large availability of meritorious women (graduate) engineers in these countries.

With a view to disrupt masculinities in the water sector, as a method, this article presents a critical feminist reading of Nepal's history of rural development and technology transfer. The aim is to trace the formation of the race/sex/gender connection in both technology-and-development–and women/gender-and-development policy narratives, and assess how it might continue to shape women's limited participation in water-decision making. The focus is on selected policy and research documents covering the era of planned development (1950s to the 2010s). In total, I collected 476 documents, from public libraries, documentation centers and private collections in Kathmandu. Places were for instance, the library of Tribhuvan University, the Ministry of Water Resources, and the Agricultural Project Services Center.[5] Documents include policy and project reports, research studies and conference proceedings, and so-called country reports of the Food and Agriculture Organization (FAO). In selecting the documents for analysis, I focused broadly on the topics of irrigation and water resources, agriculture, technology transfer and women/gender, looking for (sections of) documents that helped gaining a full picture of the various policy narratives in time. The exercise of critical reading consisted of triangulation—comparing statements, data and claims in one document with other documents—and an examination of author(s), publishing organization(s), funder(s), text and photo content of the documents. A full, detailed version of the feminist reading is presented in the book *Whiteness in Engineering* (Liebrand, 2022). Here, the focus is on presenting a shorter and summarized version.

To analyse the position of expert women in Nepal, I pick up the trail with the introduction of home science in the country. The analysis follows a thematic and chronological time order: (i) inventing Nepali women as American style household managers in the 1950s; (ii) creating wise mothers and competent wives in the 1960s; (iii) identifying and prioritizing women's needs in the 1970s and 1980s; (iv) women's rights and women's development in the 1990s and early 2000s; and (v) unequal citizens, gender and social inclusion in the late 2000s and 2010s. The final section presents the conclusion and discussion.

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5 This center, once a respectable public research organization, no longer exists; its library is now located in the building of the National Agriculture Research Council of Nepal.

3. A history of expert women in development and technology transfer in Nepal

3.1. Inventing Nepali women as American style household managers in the 1950s

Government-initiated national rural development in Nepal started in 1952 with the flagship Village Development Program (VDP) of the United States Operation Mission (USOM) (Skerry et al., 1992; Fujikura, 1996). The Americans were already active in newly independent India, perceiving a communist threat in the region (Mihaly, 2002), and early 1951, they had been the first to sign an agreement on development cooperation with the then Rana government of Nepal, just before its fall (Skerry et al., 1992). The activities of USOM were modeled after the Community Development Program in India funded by the Ford Foundation (Staples, 1992). As a Western adviser of the FAO commented in a policy paper in 1966, these programs aimed to 'bring new ideas into [the] villages' and focused on rural extension and the direct transfer of knowledge (Donner, 1966, p. 7). The first country director of USOM in Nepal and the first country representative of the Ford Foundation in India had both worked as agricultural extension officers in the US (Skerry et al., 1992; Staples, 1992). The introduction of scientific agriculture was perceived by the US as a catalyst for national development and a stable democracy (Fujikura, 1996). The program was to act as a two-way channel between the government and the people—state agents carrying information into the villages and bringing back people's problems to the government. With assistance from USOM, state training centers were opened to teach medium-level technicians and village development workers (VDW) (Chapagain, 1972). These new VDWs were to interact with villagers.

The Americans intended to have a nationwide impact and they envisioned radical changes in existing patterns of farming. The transfer of science and new technology was meant to cover every single aspect of rural life, both in and outside the household. The Americans and other Western advisers anticipated that the villagers would turn subsistence farm households into "farm enterprises" (Rauch, 1954), abandon backward agricultural practices, and adopt new technologies such as irrigation, fertilizers, pesticides and high-yield crop varieties (Theuvenet, 1953). It was expected that they would change food habits and adopt a more nutritious diet (Donner, 1966). The state was conceived as the principal development actor, introducing poultry, pig farming, fisheries, food storage methods, and new credit schemes, for instance, through its aid programs (Sakiyama, 1971; FAO, 1975). To make this work, the Americans envisioned, it was important that the entire village community would be actively involved, ideally through the establishment of women and youth movements in the villages alongside farmers' organizations (FAO, 1969; Staples, 1992; Fujikura, 1996). In this model, farm women were primarily targeted as caretakers for drinking water, sanitation, health and nutrition—the field of expertise in development planning of home science or home economics.

In the US, home economics was established as a science discipline around 1900 at so-called land-grant colleges.[6] There, it was developed as an integral part of national rural development programs, aiming at activities for farm women and closely related to agricultural innovation programs oriented toward farm men. It was also promoted to "integrate" rural women of Native American and Afro-American background into the national culture and economy (Jensen, 1986; Janiewski, 1988; Walker, 1996). After World War II, under Marshall Aid, it was introduced as part of rural development planning in parts of the world under control of the US and European countries, and it also was connected to the FAO, WHO and UNICEF programs in developing countries, especially in regard to food, nutrition and health (Hamilton, 1965; Axinn, 1988; Sachs, 1996). In the case of Nepal, home science was thus directly introduced by the Americans in the 1950s, through their aid. Its introduction created for women in Nepal the first space to act as "professionals" in development.

In 1954, the Ford Foundation started a women's school in Kathmandu to train women village development workers in collaboration with USOM (Figure 1). Classes began in 1956 and USOM recruited an American female home economics adviser to work with the program from 1956 to 1960 (Ensminger, 1966). In addition, five Nepali women were trained outside Nepal. They can be considered the first expert women in rural development in Nepal. The training at the school was designed for 1 year and the subject matter included food, clothing, home management, handicraft, child care, gardening and poultry (Donner, 1966). In 1956, the Ford Foundation also assisted in setting up of the Nepal Women's Organization,[7] which was to function as the overarching national association to organize women in Nepal. Parallel to these activities, starting in 1956, the College of Education in Kathmandu, a training facility for school teachers, offered elective courses in home science (Donner, 1966).

In their capacity as home scientists, expert women were assigned a supportive and subservient role in rural development. In the 1950s, Nepal was diagnosed by Western advisers as an "archaic society and economy", and to achieve social welfare and economic progress, it was envisioned that "a considerable amount of people and capital would have to be diverted from agricultural to non-agricultural sectors" (FAO, 1969, p. 7–8). Rural men were the first target of this vision. By making agriculture more productive through technical aid, it was expected that a large part of the rural population could be turned into an industrial labor force. In the process, rural women were to contribute and act as "managers of the family", running the household efficiently with the available resources, and supporting household male members in their more productive roles in agriculture and industry (Sharma, 1966, p. 128).

Innovation in the household was thus demarcated as the domain of development for women, and the application of technology to facilitate changes in the labor force marked as the domain of men. In this dichotomy, the teaching of women on new technologies for the household, and the training of women as home scientists embodied a small and clearly marked space for the practice of expert women in technology. As stated in a policy evaluation report of the FAO of 1972, it was "*young men* from the villages who were willing to work with their hands, able to read, write and do simple arithmetic [calculations] and *willing to work where-ever assigned in Nepal*, [that] were selected [for technical and agricultural specialists jobs] and given 4 months training" (emphasis added) (Chapagain, 1972, p. 7). In contrast, young women from the villages were expected to act as VDWs and home scientists.

The foreign-assisted expansion of the modern state in Nepal in the 1950s provided very few job opportunities for expert women in technology. The following excerpt from a conference paper by one S. Sharma, a female "assistant home scientist" at the second agricultural conference in Nepal in 1964, aptly summarized the situation (Sharma, 1966, p. 129):

> "Some foreigners visiting our country have observed that the wastages in one country [Nepal] are much greater than in other countries [the West]. Much wastages occurs in the food cooked and served, throwing off of the nutrients from foods through practices such as peeling of vegetables, discarding cooking water from rice, over cooking of vegetables, deep fat frying and use of highly milled rice or wheat (…). No amount of government will help to save this, until the women are trained to be aware of this wastage and learn scientific methods to avoid them. Home Science education gives this much needed knowledge, and thus it contributes immensely toward increasing and conserving national wealth."

The description in this quote showcases that the promotion of development in Nepal only endorsed job opportunities for expert women in technology which had a direct connection with the perceived role and position of rural women in the household in general. In the 1950s and early 1960s, based on a system of gender segregation in technology transfer, the place and expertise of women in technology in Nepal's rural development programs was thus narrowly constituted in the form of "women's training" and practices inside the home.

This gender segregation was (also) strongly normalized by India's growing involvement in Nepal's engineering and public works sector. In India, the engineering profession already was established as an exclusive, elite and male domain, introduce by the British in the 19th century to forge new cultural hierarchies among males, between British white and non-white Indian men, and between engineers of different rank, through connections between engineering and the army (Zwarteveen, 2011). The Americans disdainfully referred to Indian's "brick and mortar" focus in development (Skerry et al., 1992, p. 43), but they were unable to prevent that India's approach to development, focusing on engineering, became influential.

On the ground, the progress of the VDP and the development of home science activities was much slower than anticipated. By the end of 1958, less than 6 per cent of Nepal's 28,750 villages were covered by the VDP, and only 613 of the planned 4,000 VDWs had been trained (15 per cent). At that time, just 29 female VDWs

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6   Land-grant colleges are so called since they were originally endowed with land and set up to teach practical subjects such as agriculture, science and engineering, as opposed to the general orientation toward liberal arts in institutions of higher learning (Knowles, 1985).

7   Not to be confused with the later Nepal Women's Organization in the Panchayat-era (1961-1990).

FIGURE 1
Women village development workers in Nepal in the 1950s. Source: USOM (1958, p.15). Training of Nepali women students to bind straw as a demonstration for model household use in Nepal.

had been trained (about 5 per cent of the total envisioned number) and only 30 girls per year had enrolled in the training program (USOM, 1958; Chapagain, 1972). By the mid-1960s, the situation had barely changed. In 1964, there were only 10 female home economic specialists with a bachelor's degree in Nepal. By 1966, 230 women had completed training on home science and about 50 had followed elective courses in it (Donner, 1966; Skerry et al., 1992). In the meantime, most trained female VDWs got married, left the service, or decided not to do this work anymore for other reasons, and it was nearly impossible to get candidates to serve in remote places (Donner, 1966).

A professional career as a field worker or home scientist in the 1950s and 1960s was thus only available to a very select group of Nepali women. Its introduction was nevertheless critical in establishing a place for expert women in technology, albeit putting them in a gender-restricted and subordinate position. The few women who managed to become professionals at that time "surfaced" in the less prestigious area of home science, and those who went to the US for training mainly ended up dealing with "social issues" in rural development such as girls' education, health and nutrition (USOM, 1958; New ERA, 1973; Winrock, 1980).

3.2. Creating wise mothers and competent wives in the 1960s

From 1961 onwards, the nationalist Panchayat state further delineated the space for expert women in technology.[8] The Panchayat system's ideology was fortified by the king's claim of supreme authority according to what was stated to be sacred Hindu traditions and customs of the kingdom (Tamang, 2002). National reconstruction, resisting foreign (cultural) influence, and

the creation of a single national culture based on a particular interpretation of Hindu norms became the objective. Accordingly, "the home" and "the family" became key institutions for nation-building, and "women's training" turned into a central concern of the state. In it and according to Western models of development, women's position in Nepal was affirmed as "mothers" and "wives". Western donors supported the Panchayat state and such a notion, I noted earlier, because they perceived a communist threat in the region and imagined Nepal as being a part of the non-aligned nations and "underdeveloped Third World". In this image, the people of Nepal were portrayed as victims who were struggling to become modern (Tamang, 2002, p. 314).

A newspaper article "Women's Role in National Reconstruction Affirmed" in *The Rising Nepal* of 1966, a government-controlled outlet, illustrates how the state promoted modern ideals for Nepali women (Esnaarjay, 1966). It reports about Mrs Kamal Rana being the initiator of the Women Volunteer Service in 1953 and the president of the new Nepal Women's Organization. Reportedly, she worked tirelessly for "the noble cause of the upliftment of the Nepalese women", educating women on state reforms. It mentions that she represented "Nepalese women" in international conferences in Colombo, Moscow, Peking, New York, Teheran and Geneva, and that she is interested in "social and relief work". It also says that she played table tennis, read books on constitutional history and public administration, spent time knitting, and talked in "the most candid manner" with "her characteristic smile". Commenting on the economic standing of Nepali women, she is described to have replied that "a small industry for glass bangles would be of some use". As can be derived here, modern Nepali women were envisioned by the donor-supported Panchayat state as educated (reading books), homely (knitting) and docile (candid manners), and implicitly, wedded and upper-caste (glass bangles, an ornament used especially by married, upper-caste Hindu women in Nepal).

The Western ideal of women as efficient household managers and the Panchayat view of women as guardians of national culture

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8   The Panchayat system (1961–1990) was a form of "guided" democracy under direct rule of the King (Whelpton, 2005).

provided for a fortuitous match. The earlier-mentioned conference paper of S. Sharma from 1964 also stated, for instance, that the "home is an integral part of society", that "healthy, happy home[s] are the nucleus of a healthy, happy nation" and that "it is important therefore, that our women are helped to acquire the knowledge and skills essential to be *wise mothers and competent wives* and responsible members of their community" (emphasis added) (Sharma, 1966, p. 128).

By then, the US already had phased out of the Village Development Program and in 1959, its activities had come to fall under the Department of Agriculture (DoA) (Skerry et al., 1992). There, the VDWs continued their careers as Junior Technical Assistants (JTA) in agriculture. Among them were some women, female JTAs who had specialized in home science. They had an opportunity to pursue a career in the newly established Agricultural Extension Section of the DoA (Chapagain, 1972). There, work on home science continued in the 1960s, with an aim "to give a picture of an advanced domestic life" to the rural population (Donner, 1966, p. 1). By the mid-1960s, there were about 35 female JTAs in the DoA, working mostly in the Kathmandu Valley and the Eastern Tarai (Donner, 1966). Their main activity was the establishment of so-called women's clubs and explain to farm women new ideas on home management.

The original Village Development Department was transformed by the state into the new Panchayat Development Department (Donner, 1966; Chapagain, 1972), a forerunner of the powerful Ministry of Home and Panchayat, the central agency of the Panchayat state for building up the new political system. In 1966, the "home science service" of the DoA was shifted to this ministry and it started to directly fund and train the Nepal Women's Organization (NWO) of the state (Donner, 1966; Chapagain, 1972; FAO, 1974). The NWO soon established offices in the districts, 57 of the 75 districts were covered by 1966, and each office was staffed by two trained women who received a state salary (Donner, 1966).

These events had implications for the place of expert women in technology. Technical expertise was considered a secondary concern by the Panchayat rulers, and to beef up staff numbers in the NWO, the training of "women development officers" was shortened from 1 year to 6 months. This meant that secondary school education was no longer expected for the training of women officers, and some of the village workers on which social mobilization for home science education relied, could hardly read and write (Donner, 1966). In these early Panchayat years, women's development was thus further "professionalized" as a job of handicraft, sewing, nutrition, child care, family planning and community development.

Tied down to women's training, the place of female JTAs and home scientists was difficult in those early years. Female home scientists, with a focus on the household and farm women, faced a huge variety of food habits and cultural practices, more than in any other profession, and they encountered a host of ethnically and regionally distinct forms of intra-household organization. Unlike other policy literature of that time, home science writings of the FAO mention in 1969, for instance, the existence of "areas and ethnic groups" and "food taboos" in Nepal, stating openly that "one should never forget that religious taboos and customs regulate the food habits of the average Nepali in a very strong way" (FAO, 1969, p. 8 and 13).

However, stating the obvious that such differences could not be ignored in development was qualified by the Panchayat state as anti-nationalist and anti-modernist (Subba et al., 2002). Illustratively, a report of the FAO of 1972, written by a Nepali author, indicates that the prevailing diversity in customs and food habits was to be interpreted as "the majority [of the rural population] still [being] unresponsive to the new wave of change" (Chapagain, 1972, p. 13). The Panchayat elite, aware of these tensions, made clear to foreign donors that "the Government (...) was interested *only* in securing an increased output of the traditional food-stuffs", and female JTAs and home scientist were expected to work within the framework of a "national nutrition policy" based on the proposition that "the common man in Nepal (...) certainly lacks a balanced diet" (emphasis added) (FAO, 1969: 5 and 13).

In line with these Panchayat state priorities, the FAO advised the government of Nepal in 1974 to implement a national "women's program (…) separate but integrated into the overall rural development plan". It stated, for instance, that "the IAAS [Institute of Agriculture and Animal Science] should open its doors to women as well as men", and argued that "the curriculum for the certificate in agriculture [for women] should have a home science bias, with specialized courses such as child care and feeding, foods and human nutrition, home/farm management and handicrafts" (FAO, 1974, p. 11–12).

Given these circumstances, the attrition rate among mid-level technical personnel in Nepal in the early 1970s was high. For JTAs, the attrition rate of over 41 per cent was reported by American consultants, including people who never enrolled for public employment after graduation or left government service after 4 or 5 years (New ERA, 1973). Gender-disaggregated data are not available, but the attrition rate for female JTAs presumably was even higher. For them, there was very little scope under Panchayat surveillance to address the concerns of rural women among Nepal's diverse ethnic and regional groups.

3.3. Identifying and prioritizing women's needs in the 1970s and 1980s

In the 1970s, donor agencies, based on Western social sciences, began to conceptualize "women" as the poorest and most disadvantaged category of people in the world (Rathgeber, 1990). The UN declared 1975 as the International Year of Women and 1976-1985 as the Decade for Women, and taking inspiration from this, USAID started funding a multidisciplinary research project on women in Nepal, carried out by the Center for Economic Development and Administration of Tribhuvan University. The field studies especially, *The Status of Women in Nepal (Volume II)*, were important (Acharya and Bennett, 1981). The funding of *research on women*, rather than training of them, marked the start of a more reflexive attitude among donors, and being the first of its kind, the study brought attention to the contribution of women in Nepal's agricultural economy (Acharya, 1993; Thapa and Ramsbotham, 2017).

Similar to female Nepali JTAs and home scientists in the 1960s and 1970s, the study team, consisting of Nepali and Western researchers, was confronted with regional differences, and a host of ethnically and caste distinct forms of intra-household organization. In studying "the actual contribution women make to the rural economy", the team articulated that "Nepalese women are not a homogeneous group", acknowledging "class", "caste" and "different ethnic groups", and it aimed to cover as many "cultural groupings" as possible in selecting villages for field research.[9] The report's conclusions, however, were meant to support the cause of the Panchayat state, i.e., "to facilitate the increased integration of women in the national planning process" (Acharya and Bennett, 1981, p. xxiii), and the explicit attention to differences *among* rural Nepali women ended up strategically being downplayed by the government.

The study of Acharya and Bennett led to the inclusion of women as a specific (read: undifferentiated) group in the Sixth Five-Year Plan (1980–1985), and it inspired the government to set up a new Women's Development Section under the Ministry of Panchayat and Local Development. These actions fitted the global trend of WID thinking (Fujikura, 1996). Through the WID lens, women in Nepal were now imagined by donors as sharing productive, reproductive and community roles with women across the globe, irrespective of differences of class, caste, race, ethnicity, religion etc. It effectively enabling the Panchayat state to take the credit for bringing to the fore the "women's question" in Nepal, Nepali scholars have argued (Tamang, 2002). Notably, the Ministry of Panchayat and Local Development, through its Women Development Section, began a program for women's development, called the Production Credit for Rural Women (PCRW) in 1982 with support from UNICEF. Channeled through the district offices of the ministry, it was handled by Women Development Officers and Women Development Assistants (MoFA, 1998). The program adopted a group loan scheme to promote community development in the fields of agriculture, water supply, health, literacy, and infrastructure, and soon, it received support of more donors.

Western consultants and donors in Nepal advised every project to define women as a target (Chhetri and Lingen, 1998). SNV from the Netherlands was among the first NGOs that started working in the WID modus. It started its first "women's project" in 1981 (a women's training center), formulated a "women policy plan" in 1986, and continued to prioritize "women's development" in the 1990s (MoFA, 1998). In the Mechi Hill Irrigation and Related Development Programme (1987–1992), for instance, SNV stated that "approximately (...) 1000 women of the project area [would be] involved in rural development planning, training, extension, excursions, via the establishment of women groups in *all projects*" (emphasis added) (SNV, 1987, p. 18). Hereby, relations between men and women were conceptualized one-dimensionally as men having power over women, as a game of "you have more, I have

FIGURE 2
Training village women to cup pipes for drinking water systems in 1988. Source: Private collection, see also Liebrand (2022, p.113). Training of the Mechi Hill Irrigation and Related Development Programme (1987–1992).

less" (Bobbink and Boomsma, 1995, p. 6), and Nepali women were expected to "take power from men", meaning implicitly, that the activities of men were treated as the norm (Figure 2).

Interventions such as the PCRW and the Mechi irrigation project, inspired by WID thinking, helped thus to re-validate a subservient place for expert women in technology. It conferred upon them the role of "women experts" in development, thus re-aligning technology and masculinity in the process, and legitimizing male domination in engineering. To illustrate this point further, the Dutch government, through SNV, funded around 20 Dutch professional women "volunteers" for the PCRW program between 1983 and 1992, to assist with women's development. These women had professional or university education in social sciences or agriculture; were mostly between 25 and 30 years old; had little or no experience in working in developing countries; and were contracted for a period of 3 years (MoFA, 1998). In Nepal, they ended up working among rural women alongside Nepali female Women Development Officers, rather than with and alongside engineers for instance.

The presence of Western expatriate women as "women specialists" and counterpart staff in the PCRW program, must in fact have confirmed a status of modernity on the subservient role of Nepali expert women in technology. It probably was one of the reasons why the program was perceived to be a huge success by the government and donors. Progress in the PCRW

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9 The following communities were selected: Parbatiya (hill upper-caste people), including Bahun, Chettri, and "low-caste" Sarki; Newar, Tamang, Rai and Magar (ethnic hill people); Baragoanle (mountain people), and Maithili and Tharu (Tarai people) (Acharya and Bennett, 1981, p. 1, 2 and 6).

was slow—it covered 24 districts by 1986 and had spread to 58 by the end of the mid-1990s (77 per cent of all the districts in Nepal)—but project staff consisted of young, motivated and well-educated Nepali women, who had an opportunity to work with enthusiastic Western expatriate volunteers and learn from them (MoFA, 1998).

The propagation of the new GAD approach by donors from the late 1980s onwards did not significantly alter this dynamic. The more holistic lens of "gender", compared to "women", did not easily lend itself to integration into development programs (Rathgeber, 1990). In the Mechi project, for instance, under the influence of GAD, women experts started to work *with* engineers, for the first time since the 1950s, but it did not change overall project dynamics. SNV then was a construction-oriented NGO, male dominated (up to 85 per cent of personnel) and the Mechi project was controlled by Dutch and Nepali male engineers (Bobbink and Boomsma, 1995). The presence of one Dutch female engineer in it was a notable exception. The only other Dutch woman expatriate in the project was an anthropologist, hired as a "socio-economist" to focus on women's inclusion (Verschoor, 1988). In the second phase of the Mechi project (1993–1998), SNV hired Nepali and Dutch women as Women Involvement Officers, to work with engineers, focusing on sanitation and vegetable gardening (Bobbink and Boomsma, 1995). In spite of these changes, the trend was that expert women in the project functioned as "side-kicks" of male engineers whose focus was construction.

The focus on "women needs" in the 1970s and 1980s thus hardly triggered a debate in Nepal on the subordinate place of expert women in technology. In projects such as the PCRW and the Mechi irrigation project, "women" were conceived by donors and Panchayat officials as a homogeneous group. By implication, the lives of both white expatriate women and educated, upper-caste Nepali women experts were thus conceived as related to the lives of Nepali women in rural areas. It probably was true that white, middle-class women who entered aid projects in the 1980s, and Nepali upper-caste women with whom they interacted, were more sensitive than their male peers to the exclusion of rural women in Nepal due to the influence of ideals of international sisterhood in the West (White, 2006), but it also was true that their lives had not much in common nor did either have much commonality with the lives of rural women in Nepal. Because differences among women of class, caste, ethnicity and race were not discussed, consciously or otherwise, the whole debate on women needs in the 1970s and 1980s failed to create a space for women of higher class to act as engineers in Nepal.

Meanwhile, engineering departments such as the Department of Irrigation came to act in the 1970s and 1980s as the most prestigious organizations in the state's structure, supported by loans of the World Bank and the Asian Development Bank. These decades were the heyday of infrastructure development in Nepal, and promoted by Panchayat state propaganda in brochures with titles like "Water the key to Nepal's development" (HMG/N, 1981), it was the time that the engineer was stereotypically popularized by the state as a man who masters science and technology, tames nature, and creates new flows of water on underutilized lands. Such propaganda further delineated the discursive space for women to act as engineers in Nepal.

3.4. Women's development and women's rights in the 1990s and early 2000s

In 1990, the Panchayat government was forced down by a popular movement and leaders of the opposition led the way to a return to multiparty democracy. The guarantees of political and civil liberties in the new Constitution reflected the consciousness of the Nepali people, of seeing themselves as sovereign citizens and rights-holders, and with the reinstitution of a multiparty system, identity-based exclusion and discrimination became major themes in Nepali politics (Gurung, 2006; Hangen, 2007). Ethnic groups started to mobilize themselves as indigenous nationalities (Adibasi Janajati), alongside so-called untouchables (Dalits) and people from the Tarai region (Madhesi), demanding inclusion in the state system (Onta, 2006). Amidst these movements, Nepali women's organizations revived themselves or established new ones, often being aligned with a political party, and in the private sector, ostensibly "non-political" women NGOs were set up by activists or entrepreneurs, capitalizing on new funding opportunities and no longer being restricted by Panchayat oversight. Many of the new organizations adopted the language of "women's rights", raising issues such as equal property rights, quotas in education and jobs, including in technical and engineering education, and a voice in political parties and the government (Acharya, 1993).

Amidst these debates, Nepali feminist scholars, for the first time since the 1950s, had an opportunity to openly reflect on past and current practices of "women's development" in Nepal. Notably, earlier-mentioned Acharya criticized in 1993 the gendered ideologies behind trainings of rural women in Nepal, noting that "trainers and most of the trainees are guided by *Indo-Aryan ideology of idealized domestic role of women*" (emphasis added) (Acharya, 1993, p. 22). As can be surmised, references to racial vocabulary and ideologies ("Indo-Aryan") surfaced promptly in these reflections, but discussions on it did not further develop then.[10] Rather than exploring the connection of race, sex and gender, the whole issue of dominant gender ideologies in Nepal came to be problematized by Nepali and Western feminists in terms of Hindu "caste" domination and the standardization of the "Nepali family" according to upper-caste Bahun and Chettri norms (Tamang, 2000, 2002; Hangen, 2007).

Meanwhile, "women's development"—not "women's rights" *per se*—remained high on donor's agendas and the new democratic government in Nepal followed suit. The Eight Five-Year Plan (1992–1997) used the word "gender" for this first time, reflecting GAD thinking, and in 1995, the Nepali government signed the UN Beijing Declaration and Platform of Action, which calls upon governments to develop national plans of action to improve the situation of women in their country. Following up on it, for instance, the government established a separate Ministry of Women and Social Welfare (Chhetri and Lingen, 1998), and set up "women cells" or appointed a staff member as a focal point to deal with "gender issues" at various ministries. The Ministry of Agriculture for instance set up the Women

10 In the 19th century, the Sanskrit word *arya* was racialized with the adoption of the term "Aryan" and "Indo-Aryan" in European human race theory and the racial theory of Indian civilization (Hangen, 2005).

Farmer Development Division in 1992 to assure the integration of farm women at all planning levels (Government of Nepal, 1994).

As part of these new measures, basically for the first time in Nepal's history, donors and the government of Nepal also started to implement measures that could potentially improve the position of expert women in technology, at least in theory. The government referred to increasing women's representation in decision-making, calling for monitoring of gender discrimination at work (Acharya, 2001), and state policies such as the Agricultural Perspective Plan of 1995 and the Ninth Five-Year Plan (1997–2002) prioritized the admission of marginalized groups like Janajati to higher levels of technical education and it formalized a call for more women engineers and technicians. NGOs, such as Winrock International, started to provide funding and scholarships to women students for training in the field of water and natural resources management (Devkota, 2003; Karmacharya et al., 2003).

In spite of the new measures to address discrimination of women in education and jobs in the 1990s and early 2000s, the situation for expert women in technology barely improved. By and large, researchers observed, donors and the government continued seeing "women's rights" through the lens of "development and welfare" (DfID/WB, 2006). Studies in Nepal on irrigation and gender in the 1990s, for instance, were interpreted by engineers to disconnect the debate on the exclusion of women in irrigation projects from critical debates on technocratic state policies and the exclusion of women professionals in the engineering profession. The gender question was handled by them as an opportunity to strengthen their position and rationalize their claim for *more* infrastructure development. As a policy report from 1998 stated: "gender mainstreaming of irrigation projects can be *equated* with the "rationalization" of [irrigation] projects, meaning that the design of projects and the allocation of services and resources is rationally targeted to the appropriate farmers, men and/or women who can maximize the use of the services and resources provided" (emphasis added) (WECS, 1998, p. i).

In this context, the situation actually seem to have worsened for expert women in technology. Under the Ministry of Local Development, for instance, an agency in Nepal that traditionally is involved in rural engineering and drinking water supply, women officers of the Department of Women Development (DWD) faced strong male bias and bureaucratic resistance but they had access to the technical line agencies of the ministry and field staff, enabling them to work *with* engineers and doing work in drinking water projects. However, with the move of this department to the Ministry of Women and Social Welfare in the 1990s, they were placed in an agency with no grassroots presence in the districts and villages, and their work was further marginalized from the networks of development in the districts (DfID/WB, 2006). In fact, the expansion of the ministry to include children in 2000, being renamed the Ministry of Women, Children and Social Welfare, can be seen to have further circumscribed the working opportunities of these officer women. The new ministry's name presented women and children as one category, reinforcing a gendered notion of mothering identity and care-giver role of women.

FIGURE 3
Studying gender, caste and ethnic exclusion in Nepal in the 2000s. Source: DfID/WB (2006, p.85). Community forest group with placards, reading "establish community forestry rules" and "stop insurgents from destroying our community forests".

3.5. Unequal citizens, gender, and social inclusion in the late 2000s and 2010s

In the course of the 2000s, the debate on identity-based exclusion and women discrimination intensified in Nepal. In 1996, the Communist Party of Nepal (Maoist) started a "people's war" after the government had refused to give in on their demands (Upreti, 2004; Bennett et al., 2012; Drucza, 2017). These included that Nepal should be declared a secular nation; ethnic communities should be allowed to form autonomous governments; patriarchal exploitation of women should be stopped; and the system of untouchability should be eliminated (Thapa and Sijapati, 2005). By the early 2000s, with the violence increasing, the government and donors realized that the Maoists mobilized support among ethnic groups and Dalits, including among women of these groups, and the National Planning Commission (NPC), writing the Nepal Poverty Reduction Strategy Paper/Tenth Five-Year Plan (2002-2007), was looking for ways to improve service delivery to the Nepali people in terms of "social inclusion". The debate on "women", once again, shifted from "development" to "rights", and the new policy focus required new data on the status of women in Nepal. In response to this call, in 2001, the British Department for International Development (DfID) and the World Bank in partnership with the NPC initiated a multi-year research project: the Gender and Social Exclusion Assessment (GSEA), to be led by earlier-mentioned Bennett (DfID/WB, 2006) (Figure 3).

The GSEA study was finished in 2005 and like the earlier-mentioned field studies of Acharya and Bennett, it can be considered a milestone in research on gender and social exclusion in Nepal. Inspired by the concept of liberal democratic citizenship, it conceptualized men and women in Nepal as "unequal citizens", as individuals whose participation in development is hampered (or enabled) by identities of gender, caste and ethnicity. It resulted in the collection of detailed gender-disaggregated data on "women, the poor and excluded", focusing on "ethnic" (Janajati) and "caste" (Dalits) groups. Following up on it, the government implemented further measures to address social exclusion in Nepal. The earlier-mentioned Tenth Five-Year Plan (2002–2007), more clearly than previous ones, adopted rights-based language, articulating the aim to create an egalitarian society based on the notion of women's rights and stating explicitly the need for civil service reforms and inclusion of women officers (DfID/WB, 2006). The Eleventh Three-Year Interim Plan (2007–2010) rearticulated these objectives, and in the period up to the new Constitution of 2015, a number of legal and policy provisions were implemented which were designed to address the exclusion of women in Nepal, including of expert women in various professions, notably through a new system of reservations (quota) in the civil service and higher (engineering) education (Thapa and Ramsbotham, 2017).

In contrast to the *Status of Women in Nepal* report of 1981 which had focused on rural women in Nepal and provided concepts for the exclusion of especially this large group of women in Nepal (Upadhya, 1996), the GSEA study in theory enabled Nepali expert women to conceive their own subordination in engineering and technology, as it problematized in principle *the whole* institutional landscape for overcoming gender, caste and ethnic exclusion (DfID/WB, 2006). For instance, the GSEA assessment of the irrigation sector in Nepal, published in 2012 as a complementary study, called attention for the discriminatory effects of norms of budgeting, staff recruitment, formal incentives for staff performance evaluation, and valuation of non-construction work in the Department of Irrigation (ADB/DfID/WB, 2012). It does so apart from the identification of the usual "barriers" in irrigation development for "women, the poor and the excluded", i.e., limited access to land, technologies, services in remote areas, and participation in formal users' groups. Illustratively, the report concluded: "Changing cultures, behaviors and structures [in the Department of Irrigation] requires that some of the longer-term exclusion issues are addressed, such as promoting the conditions for entry to employment in the irrigation sector through investments in scholarships, changes in the content of training courses of government staff, and creating more supportive working environments for women professionals" (ADB/DfID/WB, 2012, p. 59–60).

To date, however, similar to the 1990s and early 2000s, the new research and policy thinking has not really trickled down to new opportunities in Nepal for expert women in technology, in fields such as irrigation development (cf. Tamang, 2009). The presentation of "gender problems" in official reports continues to rely on an image of "the Nepali women" (Bennett, 2017), generalizing first and foremost specificities of Janajati, Madhesi and Dalit women's exclusion (Sob, 1997), but also, by implication, specificities of the exclusion of women in other particular contexts, such as the subordination of expert women of Bahun, Chhetri and

Newar background in engineering and technology (Liebrand and Udas, 2017).

Meanwhile, in the course of the 2010s, there also occurred a national elite backlash to social inclusion (Cox et al., 2015). As a result of the Maoist insurgency, gender discrimination and social exclusion are now openly politicized, and with the signing of the Comprehensive Peace Agreement between the government of Nepal and the Maoist, these issues became entangled with new patron-client political settlements of the state (Drucza, 2017; Thapa and Ramsbotham, 2017). In this context, donors and Nepali researchers involved in the GSEA study have come to face strong conservative pushback for their engagement on social inclusion, with donors especially being blamed for driving a divisive social inclusion agenda in Nepal (Drucza, 2017). In response to these dynamics, Bennett pointedly noted in 2017, the whole debate on women's rights, once again, has been re-articulated in interactions between donor and government officials as the less contentious subject of women's development. Tellingly, in 2011, women engineers' place in Nepal's irrigation department was described in a NGO assessment report as "changing" (SaciWaters, 2011), and today's dominant view holds that women are "entering" the engineering profession in Nepal. Such words and views express dominant social norms of neutrality and impartiality in development thinking, and they indicate that women's marginal place in engineering and technology is hardly problematized in Nepal.

4. Conclusion and discussion

The critical feminist reading of Nepal's history of rural development and technology transfer presented above reveals that expert women in Nepal, like elsewhere in the South, have occupied a subservient position in development planning from the start. In the case of Nepal, it is a history that can be traced back to the 1950s, with the start of foreign aid. Ever since then, science and technology domains, and dominant ideas on the modern roles for men and women in Nepal, have reflected cultural practices as they existed in the West. This means that the technical and engineering disciplines were constituted as a place for professional men, and the humanities and social sciences as a place suitable for professional women.

Based on an originally Western conception of men/women as being the major hegemonic dichotomy in society, expert women in technology were conceived in development planning as the ideal actors, by virtue of their female body and experience, for dealing with women's needs among the rural population. The introduction of GAD thinking in Nepal and the focus on women's rights in the GSEA assessment in the post-2006 period, has not radically challenged this conception. By and large, the role of expert women in technology and development practice in Nepal is defined in relation to a perceived "under-development" of rural women in general. This reflects a global trend in GAD and women's rights thinking in development in which gender *de facto* is reduced to sex—to "women". Feminist scholars have long argued that the stasis of this conception is located in the difficulty of escaping biological foundationalism in feminist and gender

theory (Baden and Goetz, 1998; McCall, 2005; Ludvig, 2006; Yuval-Davis, 2006). GAD thinking feeds a process in which women's assumed shared experiences and interests are romanticized, and supports policy solutions that assume a relationship between female embodiment and representation of women's interests—like the assumption that more women in decision-making will result in feminist decisions. More than seven decades of debate on women/gender in development has thus produced a lot of work for "women/gender specialists", for women from Nepal or abroad with a social science background, but it has not created a space for women engineers. On the contrary, it has validated the intimate relation between technology, men and masculinity.

The analysis, however, also reveals that Nepali expert women in technology have always worked in rural and agricultural development alongside and indeed majority-male experts, as home economic scientists, JTAs in agriculture, and rural community development specialists, and sometimes also as overseers and engineers in infrastructure development. It is important to recognize women's historical attempts to make careers in engineering, because they lay bare a gendered structuring of technology in development, in which men's power over technology always seems to be sustained. Their attempts support a case in feminist scholarship that the continued subordination of women in society is, in fact, a central component of technological change rather than a deviation (Acker, 1990).

From the 1980s onwards, I have documented elsewhere (Liebrand, 2022), women students have substantially enrolled at engineering colleges in Nepal, and they have tried to pursue careers in engineering. Ironically, policy-driven evaluations and discussions on women in development have completely overlooked this grassroots process and it was clearly never a driving force in it. Rather, the increasing participation of women in engineering education has been the result of a system of horizontal segregation in science that has steadily changed in Nepal, through forces such as the incorporation of the Nepali economy in the global capitalist system (Whelpton, 2005). It has been the result of Nepali men and women who have pursued their aspirations for a new professional life in an increasingly globalizing world. For some professional women, these aspirations have always been about engineering.

The analysis provides evidence that men's control over engineering and technology relies on a link with race. With the introduction of science and technology in Nepal, in the 1950s, implicit racist, sexist and gender-differentiated worldviews came with it. White men from the West were supposed to teach "native" men in Nepal about agriculture and new technologies, and white women from the West were supposed to teach "native" women in Nepal about the latest insights in nutrition, health care and sanitation. Hereby, the view was that white women, because of their biological sex and female embodiment, were better suited than white men to interact with "native" women. These racial and sexist assumptions were later re-validated through the training of Nepali women abroad and the promotion of various women development policies, respectively through WID and GAD policies. Arguably, the influence of these narratives has been particularly strong in Nepal. Unlike in India, for instance, where social reform initiatives developed much earlier, starting in the 19th century and parallel to colonial rule (Chakrabarty, 2008), grassroots activism in Nepal hardly developed in the Rana era. And later, since 1951, Nepal's relation with the world has been characterized by aid and the government's heavy reliance on foreign donor approval for its development plans.

In considering these racial and sexist assumptions in the context of Nepal, and understanding how they have reproduced themselves, it is thus worth observing that WID and GAD policies in Nepal never led to a consideration of race in development. White (2006) has already argued that GAD-inspired gender policies are not innocent of a racial bias. I discussed above, Nepali feminist scholars like Acharya have occasionally reflected on racialized gender ideologies and vocabularies by referring to the "Indo-Aryan ideology of idealized domestic role of women" (Acharya, 1993). Yet, it never triggered a debate in Nepal on the race/sex/gender connection and its formation, and how "race" might inform Nepali norms of "upper-caste" patriarchy and identity-based social exclusion. Indeed, GAD thinking, by putting strong emphasis on gender, appears to have dampened or even forestalled reflections on race and sex in Nepal.

The analysis above suggests that the silence on race in Nepal is particularly problematic for women experts in technology in Nepal, including in the water sector. Historically, it was white male experts from the West who took the lead in technology transfer, and the sexist-racial norms that legitimized their presence and expertise in Nepal—the norms of the past—have been newly appropriated and validated as modern through the presence of expatriate women as women/gender specialists in technology programs. Race can also be seen at work in the self-identification of upper-caste Bahun and Chhetri groups in the Constitution of 2015 as a separate ethnic group, the "Khas Arya" (Thapa and Ramsbotham, 2017). Here, the word "Arya" basically refers to race and Nepali expert women in technology who belong to these groups thus now deal with racially coded norms of gender, i.e., of upper-caste "Arya" Hindu patriarchy. These norms, I have argued elsewhere (Liebrand and Udas, 2017), pose challenges for Nepali women in engineering. For them, unlike for upper-caste Nepali men, claiming expert authority in technology historically is connected to "being woman" and acting as a woman or gender specialist—an act that is traditionally irreconcilable with being an engineer.

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