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Technology Transfer for Women in Nepal: Applying Anderson's Framework and Implications for the MDGs

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Abstract: In the academic landscape the role of technology on poverty has predominantly been viewed with an air of technological determinism and any relationship between technology and society unilinear. Measurements or conceptualisations of its role on poverty within this tradition have predominantly focused on the engineered properties of technology with little regard to the social dimensions in which it is a construct. This paper attempts to examine the framework of analysis forwarded by Anderson to explore the impact of technology on women within Nepal. The paper works to expand on the predominant single variable analysis of poverty prevalent within the current academic discourse arguing that narrow analysis and scope has led to plethora of goal setting. It is from this context the paper proceeds to illustrate the implications of this for the amelioration of multi-dimensional poverty through the MDGs.

Beyond Anderson's Framework: The Implications of Technology Transfer for Women in Nepal.

This paper posits a discourse on the efficacy of the framework set forth by Anderson (1985) in, *Gender Roles in Development Projects A Case Book* as a framework of analysis for the impacts of technology transfer (T.T) on women in Nepal. The paper draws from an array of literature circumnavigating between feminist debate, technological constructivist theory and rhetoric surrounding the social shaping of technology. The piece initially explores the roots and evolution of Anderson's framework and therefore its locus within more current academic discourse.

The second part illustrates research findings from Nepal, highlighting the parts which work within Anderson's framework of analysis before going on to depict the fissiparous dimensions which surfaced in the field.

The final part illustrates the limitations of Anderson's framework of analysis and of the research currents surrounding gender and development. This is to highlight the potential implications for development practitioners and therefore the setback for those bodies attempting to achieve the Millennium Development Goals (MDGs) by 2020.

Placing Anderson's framework within the context of academic discourse

The first part of Anderson's framework focuses on understanding the impacts of T.T. on Productive activities. The roots of which can be traced to the collaboration between Overholt, Cloud, Anderson and Austin (1985) in *Women in Development: A Framework for Project Analysis*. The 'Gender Roles Framework' commonly referred to, from its Western origins, as the Harvard Analytical Framework formed in the Women In Development (WID) office, USAID and was one of the earliest attempts to understand the impacts of development projects on women.

The model advocates an activity profile for the purpose of dividing and distinguishing the tasks allocated by gender between productive and reproductive activities. Analysis is then made on who has access to and how much time is spent on the various tasks. The dichotomy between the productive and reproductive sphere, as a point of analysis, originates from the Feminist orthodox thread (Jain, 1985) on social bifurcation. Feminist attention focused on the general trend between men and women, where men tended to work and congregate in the public sphere and women within the household and private sphere. Terminology since evolved to denote the social conditioning of gender on the division of labour or in feminist locution; the gender division of labour. This was used to depict the trend in which men tended to congregate in productive activities such as farming or paid work and women assembled more in reproductive tasks such as housekeeping and childrearing. The WID based analysis builds from a project efficiency rationale and therefore is concerned with gender equity with regards to access to increased productivity and its 'attendant' benefits. The assumptions behind the potential positive or negative impacts for women are redolent of Lewis's dual sector model in that it concerns the ability of the female workforce to be mobilized and absorbed into the productive sphere in order to maximize its benefits.

Overholt (1985) diverges from orthodox feminist theory in the recognition of reproductive activities which as she posits, "...are often viewed as noneconomic, generally carry no pecuniary remuneration, and usually are excluded from the national income accounts." (p.6) The Harvard framework therefore forms a more inclusive model in the sense that it recognizes the labour of women, often unrecognized through analyses heavily tinted by the economic lens. Justification however for the inclusion of this form of labour in the framework is couched in the economic language and valuation of reproductive tasks as economic functions ensuring the development and maintenance of human resources for the household and nation.

The approach thus follows from the dominant paradigm which equates development with economic growth.

The activity profile forwarded by Overholt examined the impacts of projects on both reproductive and reproductive activities and since many projects include the implementation of new technologies Anderson took this easily adaptable tool and applied it within the context of technology transfer.

Anderson probes further into the possible impacts on productive activities by dissecting the five dimensions with which T.T. may have an influence. The first impact, on the practitioner of the activity provides a more in depth analysis of the gender displacement a technology may induce. Depth is also made into the different components of an activity. Within one production process different tasks may be gendered and thus the introduction of a technology into one of the components of the production may have ramifications for the other tasks. Anderson provides the example where new plough technologies introduced in Asia eased the task of ploughing often a role ascribed to men whilst increasing the amount of weeding predominantly done by women.

Clang *et al.* (2007) in, *Appropriate gender-analysis tools for unpacking the gender-energy poverty nexus* argue that in analysis of energy technologies, "...what is important is not the time spent on these activities per se, but the type and amount of energy used, the positive and negative impacts and outcomes of this energy use on women and on men." (p.5) From an economic analysis viewpoint this point is interesting with regards to resources but from another direction it also highlights not just the importance of energy for technologies but the physical energy exerted by the participant.

The second dimension looks at the timing of a production but is not inclusive of the actual physical toil excreted for a productive activity. The shift in the locus of production, analyzed as the third dimension, focuses on how technologies shifts the location of a productive activity and therefore affect women's mobility. Anderson discusses further how this concentration of production can create space for networks of organization and social capital to form for those able to access it.

The fourth aspect which Anderson examines is the impact of a technology on the skills needed for a given productive activity, this follows from theories surrounding the enclave effect. It questions the impacts on the gender gap if particular social or gender groups are

more likely to gain access to education and skills. The last aspect encompasses the attendant attributes and activities of a productive activity or even technology. Anderson uses the example of a Loreno stove to further illustrate the point. By enclosing the fire a Loreno stove utilizes wood more efficiently yet the attendant use of the stove for firelight in the evenings is compromised. Whilst Anderson's analysis of the impact of T.T. on production goes further into depth than the Harvard Analytical Framework, there is no explicit analysis of reproductive activities.

In *Mobilization without emancipation? Women's interests, state and revolution*, Molyneux (1986) explains that frameworks which exclude analysis of nurturing activities or sees them as contradictory to liberation often either endorse reproductive roles unknowingly or seek to liberate them by integrating women into the modernization process. Those who romanticize the reproductive sphere often foster the misconception that the sexual division of labour is biologically and not socially determined. They therefore reinforce the notion of women as biological nurturers. She makes the distinction between a woman's condition and social position. Whilst the former is her material state the latter depicts a woman's social position and therefore social and economic standing in relation to men.

Molyneux's work highlights a momentum away from the polarization of productive and reproductive roles, arguing that women are also often involved in community management roles. Blind to women's multiple roles, projects and technologies often increase time pressures and reinforce subordination. Often women are already employed in productive work (unpaid agricultural work or paid labour) as well as reproductive and community management roles. They are often already unpaid or underpaid and new wage employment does not reduce their many responsibilities unless an accompanying shift in social relations is achieved.

Stamp (1990) in the study, *Technology, Gender and Power in Africa* echoes this need to look at empowering women rather than weakening their community involvement and therefore decision-making authority. T.T. it is argued therefore needs to address the African cultural responsibilities towards health and nurture. Stamp advocates a research approach which infuses the feminist political economy with a better awareness of the sociological and historical reality of the recipient communities. This compromise is further illustrated in Molyneux's interpretation of women's interests.

Anderson's framework has included the tool of looking at the implications for women on the different dimensions of production. To further understand whether an impact is positive or

negative however calls for an understanding of women's interests. Molyneux highlighted the fallacy in assuming the interests of women are to be liberated primarily through the productive sphere. To make an analysis into the impacts of T.T. in terms of women's interests is to assume that due to biological homogeneity all women share the same common interests. Culture, class, religion, caste and other phenomena affect identity and for those few interests which might be shared between women as a category the term 'gender interests' is used to avoid the illusion of a false unity.

With regards to gender interests Molyneux makes a further distinction between practical gender interests and strategic gender interests. Practical gender interests are those identified by men and women in their socially accepted roles; they do not challenge the gender division of labour or gender norms but are a response to the perceived practical necessities ascribed within a specific context.

Strategic interests are those which men and women identify to challenge traditional contemporary practices and structures of oppression and subordination in society. These gender structures may place one sex in a subordinate position vis-à-vis the other and may vary according to particular contexts (i.e. relating to gender divisions of labour, equal wages, dangerous roles, power and control).

The impacts of Technology Transfers and Consumption

Anderson highlights the importance of looking at consumption as well as production, advocating that as well as a division of labour in production there also lies a gender division of labour in consumption. The division is related to production on the simple assumption that those who produce determine and have authority over consumption. The model therefore questions the implications on consumption activities directly from the technology itself and indirectly through the products of that technology. Anderson provides the example of adapted cooking stoves in Ghana, which increased the efficiency of production yet were discarded a few months into the project. The size of the stove was not appropriate for the size of the local pots and called for an accompanying increase in the consumption of new cooking pots inappropriate for the Ghanaian style of cooking.

The model differs from the access and control profile in the Harvard Analytical Framework. Where Anderson addresses the impacts of the gendered division of consumption Overholt looks further into the power relations behind consumption patterns and makes the distinction between access and control of resources. The proposition therefore is that access does not

necessarily imply the power to control resources. To control resources is to impose one's own definition over the other actors in a scenario. Access is determinable by others whereas control is a self-determining force. The Harvard Framework looks not just at the access and control of resources but also at the access to the benefits of those resources.

Characteristics of technologies

Anderson's framework provides a more comprehensive body of inquiry covering not just the impacts and implications but also the characteristics and social shaping of a technology.

A full understanding of the rhetoric surrounding technology can best be understood only when the preconceptions tacitly tied to technology as a concept are unravelled (Pfaffenberger, 1988). These conceptualizations have predominantly formed around two poles of thought; technological somnambulism and determinism. The latter illustrates technology as 'fix' and advocates like Calder and Fuller make the contention that as a neutral force it is able to change the economic, social and cultural fabric of poverty. Technological somnambulism, as Winner (1977) coined it, depicts the dominant view often amongst engineers denying any causal connections between technology and society. However, both deny the social relations and ideals intrinsic within technology's conception. It is this point which social constructivists like Bijker, Pinch and Latour (1994) pick up on and which is particularly important for the issue of technology transfer (T.T.).

Anderson illustrates the tendency for highly mechanized technologies to be adopted and dominated by males. It is important to look therefore at the origin and social influences which have shaped a technology in order to understand its impact and use by both men and women. Often Western projects brought the notion that the modernization of production through modern technologies equated to the masculinization of production. This is even though technologies often work as vehicles by which the physical biological differences between the sexes can be eliminated.

Coming from the Social Construction of Technology (SCOT) discipline Bijker and Pinch (1994) forwarded the need to avoid analyzing the success or failures of a technology on whether it 'works'. The term 'work' here denotes how a technology has been accepted by a relevant social group. Instead the concept of 'interpretative flexibility' is valued as one of SCOTs best contributions to the feminist debate. Interpretative flexibility reflects the ways that different groups involved with a technology have differing interpretations of that

technology. Technologies ‘work’ or fail because different social groups radically reform the meanings and deployment of a technology.

Callon, Latour and Law (1994) bring the idea of the Actor Network Theory (ANT) which depicts technology and society as intermeshed and mutually constitutive. Within the socio-tech ‘heterogeneous network’ actors become decision makers and non-human ‘actants’ also hold agency and thus technology can produce social life. This is in the sense that machines are inscribed during their formation and under the process of ‘interpretive flexibility’ the pre-inscribed artefact is open to different translations. Thus the idea that consumers are also an integral part of the process is important for a feminist understanding of the engendering of artefacts.

Anderson looks therefore at the consumer power and control the gender groups have over the labour market, land and capital and if certain technologies are complimentary to this. This evolved from the notion of appropriate technology advocated by Schumacher (1974) in *Small is Beautiful*. He examined how T.T. often extenuated inequalities when different social groups took command over technologies. Anderson has expanded on this to look at the inequalities in gender access and command. The framework however does not investigate the power relations and social phenomena which determine how these different social groups gain command.

Beyond Anderson

Moser (1993) developed the Development Planning Unit (DPU) framework of analysis in reaction to the WID school of thought. This was based on the view that a Gender and Development (GAD) approach would differentiate between women’s interests and gender interests. As an extension of Molyneux (1986) and Baron (1987), Moser identifies the triple roles of gender and looks at the impacts of projects in terms of addressing both practical gender needs and strategic gender needs. Moser deviates from Molyneux’s classification of gender ‘interests’ replacing it with the taxonomy of ‘needs’ however this portrays women and men as passive and the language resonates that of a top-down approach. This model attempts to look at the impacts of projects on strategic and practical needs yet no expansion to date has been made to bridge this with the impacts of T.T. on gender needs.

In, *Staying Alive* Shiva (1989) looks at the different ways of understanding production; she posits that in Western perceptions, “...‘production’ takes place only when mediated by technologies for commodity production, even when such technologies destroy life.”(p.4). The

argument posits that western ideology values natural resources as ‘productive’ only when they have been ‘developed’ with physical hardware and given an economic value and as such development is associated with a process of becoming masculine and technical.

The literature posits that two notions of poverty exist; real poverty and culturally perceived poverty. Culturally perceived poverty doesn’t necessarily equate to real material poverty, subsistence economies capable of satisfying basic needs are viewed as deprived primarily because they do not overwhelmingly participate in the market economy and consume its commodities. She looked at how integration into the market even created worse situations for women and those caught in the shift. The literature provides an understanding of culturally perceived poverty and real poverty however there is a dearth of literature distinguishing between real gender needs and culturally perceived gender needs.

Chambers (1995) illustrates an alternative framework which is based on Participatory Research in an attempt to overcome the bias inherent within the cultural lens and allow the communities in question to analyze their own situation. This has been used in approaches like the “Do it Herself” approach where women assessed their own technical skills yet this has not been applied in the context of T.T. impacts.

Testing Anderson’s Framework in Nepal

The following illustrates examples from field research undertaken in January 2008 testing Anderson’s framework within the context of rural communities in the Chitwan District of Nepal. These are interpreted initially within the framework’s perspective of analysis before proceeding to illustrate other issues significant to the analysis of technology, education, women and development within Nepal. Anderson’s framework has therefore been deconstructed into its different tools of analysis in order to illustrate the various dimensions to these case studies.

Production in Nepal

Anderson posited that the impact of a new technology would be either labor saving or employment creating. The implications for women were interpreted to be positive or negative depending on whether the tasks they performed were recognized for their value and paid in wages.

Within the Tharu village of Seisai indigenous fishing practices were performed by both men and women but remained predominantly within the female demesne. Working in groups to dam sections of the river the women would often drive the fish in one direction in order to channel them into hand held nets. The newly introduced fishing net technology required little labor since the river current itself is utilized to channel fish into an inescapable tunnel. With the T.T. came an accompanying shift in the gender division of labor and in this case the men commandeered the new technology and the tasks for which they were fashioned.

The impact therefore, based on Anderson's framework, was labor saving for the women who previously fished without consistent remunerative return. For them this freed time abridging the responsibilities within the working day.

In Jugedi the traditional 'Janto' hand-propelled mill used by women to mill rice, wheat, millet, mustard and corn was replaced with the introduction of the 'Pani Ghatta' water mill. The Pani Ghatta mill is operated by both men and women, yet this is not a true representation of the society but an illustration of the nepotism the mill operators carried as part of a family monopoly over the capital.

Traditionally with the Janto the women would have to get up daily before everyone else, usually around 4 am in order to mill for two hours before the other chores and daily demands began. The Janto is very heavy to operate and requires a lot of strength, force and stamina. The Pani Ghatta therefore alleviated this hard work and women were able to rest for longer in the morning.

In the Chepang village of Shaktikhor the introduction of new mills again replaced the Janto along with the Dhiki. This was a device which pounded and de-husked rice predominantly operated by women. It could be operated individually or in pairs. Often when the two component tasks were separated they were divided by gender. Largely men peddled the lever whilst the women brushed apart the rice and husks at the point it was being pounded. With the introduction of the new electric mills the women relinquished these tasks to the men. In most the cases men took over the tasks traditionally performed by women appropriating the activities that commanded higher skills.

Anderson (1985) explained that since women are linked more with the subsistence sector, "...there is a sense that the modernization of agriculture through the application of technologies requires at the same time the masculinization of agriculture." (p.71) This bias is

made all the more poignant in that most technologies obviate the physiological differences between the sexes; there is no great strength needed to push a button or pull a lever.

Shiva expands further on this to explain that the predominant paradigm of modernization assumes a polar dichotomy of passivity and production. Passivity, she posits, has become an assumed category of the 'nature' of nature and thus women embedded within nature are doubly unproductive. Real 'productivity' is achieved only when mediated by technologies for commercial purposes. In this sense, Shiva (1989) argues, "Development thus is equivalent to maldevelopment bereft of the feminine, and conservative, ecological power." (pp.3-4)

In the village of Bandara women were completely prohibited from using the traditional 'Halo' plough and the new tractors introduced to the area were equally adopted within the male domain. The negative social stigma attached to women sitting astride on bicycles and motorcycles within Nepal was initially advocated as the reason why the women haven't adopted the new technology. However, the Chitwan district where the research was conducted, in fact is a cultural bubble devoid of this stigma and often more women ride bicycles than men.

The roots to the prevalent notion that women cannot partake in the activity of ploughing are cultural and some even claim originate from the tale of the goddess Sita in the Hindu Bhagavad Gita scriptures. It is culturally ascribed that women should not touch a halo plough or thatch roofs otherwise a natural disaster will occur. Although the tractor is different to the halo, the deep rooted associational ties spanning back to these scriptures still bind and reinforce at present the role of ploughing with men.

The Location of the Productive Activity

The Janto was traditionally operated in every household but with the implementation of the Pani Ghatta, the location of milling became centralized. Within the Nepalese society women often perform carrying roles and every week take their grains to the Pani Ghatta water mill. Their mobility has increased outside of the private sphere in this respect. Anderson argues that those not bound by socio-religious restrictions are thus given the impetus by centralizing technologies to diverge from traditional patterns and undertake more productive activities. In Jugedi, although the women could congregate centrally they never gained the position to operate the Pani Ghatta themselves and received no remunerative return, instead they have to

pay in cash or in kind to the operators of the mill usually Rs 3 (£0.02) for one Pathi (4kg) of rice or corn.

The same trend occurred in Shaktikhor when the Dhiki and Janto were replaced by the centrally located electric mill. The traditional Khol, used to process chiuri (butter nut) 'ghee', also replaced by the new mill was too large to be located in every household. The belief that the Khol is inhabited by bhoot-haru (ghosts) meant the technology was always sited far from any local villages. It was owned as a social resource and needed to be operated by groups (both sexes). This technology centralized the location of chiuri processing between villages. Women were thus involved in the production processes in return for the processed chiuri ghee. The electric mill, however, did not involve women in the production of ghee. The finished product had to be paid for in cash or in kind through the form of mustard and chiuri cake by-products which can later be made into fertilizers, pesticides or animal fodder or paid in cash at Rs 4 (£0.03) per kg of mustard, Rs 1 (£0.007) per kg of corn and Rs 4 (£0.03) per kg of chiuri.

The Timing of Production

Traditionally in Seisai fishing would be done during the day but the new nets could be left and collected in the early mornings and evenings. The technology thus reduced the labour time needed to physically fish allowing for other tasks to be done whilst waiting for the fish to become trapped.

In Bandara the tractor is preferred over the halo not for its accuracy but for its speed. The land can now be prepared faster to fit with the seasonal time slots so that more plants can be cultivated within one year. Although the time taken to plough has reduced, the increased output per Nepali kattha (338 meters square) accompanying the agricultural intensification has increased other labour demands. Anderson cautions that because various links within the production chain are assigned by gender, project planners need to overcome the assumption that the labour freed from the former task will be available to the latter. Whilst the tractor reduced the labour involved in ploughing it increased women's workloads in cultivating, weeding and harvesting and thus increased the potential for women to gain economic returns.

Skills Needed for the Productive Activity

The skills needed to use the halo plough were passed as tacit knowledge down the patrilineal line. The tractor called for skills training in driving taught informally by local drivers to other

males without a license. This may follow from the patrilineal system of knowledge transfer in that training was on a one-to-one and selective basis.

In the village of Solakhapur, training was given to women through a government run program in order to equip women with the skills in manufacturing and utilizing briquette stoves.

Originally women operated the chulo stove and the practitioners of the new briquette stove remained predominantly women. It is unsure whether women continued in this task primarily because the skills training was aimed and incorporated them or because the new technologies did not appear vastly 'technical' or distinct from the traditional chulo. Made from local clay, rice husks and the cores of sweet-corn they were highly similar to the traditional stove.

Related Attributes of Activities of a Productive Task

Attendant activities associated with the introduction of tractors in Bandara included the increased application of fertilizers in order to maintain the soil integrity and carrying capacity from the pressures of agricultural intensification. This has also led to more diseases and has called for more measures to eradicate pests. The chemical spray pump was thus introduced to aid with this. Both men and women have been using this technology however pesticide application has the attendant need for protective gear. The male operators of this understood the risks and whilst they did not use gloves and masks they improvised with their handkerchiefs. The women did not receive any training or awareness of the health risks and thus were more vulnerable to the negative health risks of pesticide use.

The Effects of Technologies on Consumption within Nepal

In Bandara increasingly more inputs are needed to sustain the technology and the carrying capacity of the exhausted land. Unavailable locally as by products from other livelihood flows more and more capital is needed to purchase these factors of production which again call for increased intensification. Consumption costs are also increasing, fuel prices have increased and the tractor owners have mitigated this by increasing the rent per hour for their service. Men are able to consume and access new fertilizers and pesticides easily. Since these resources are often controlled by men, when a woman does attempt to buy pesticide in the local market local vendors are often suspicious and refuse to sell to the woman in fear that she will use it to commit suicide.

In the villages where the Pani Ghatta and electric mills replaced traditional means the quality of the flour changed. Women noted that the finer grain reduced their cooking time by half since it absorbed faster. Some women, however, resorted back to using the Janto in order to

combine its coarser flour with the flour produced in the new mills. This whole grain flour was preferred for its taste and its nutritional value for the family. It was healthier and cheaper because the coarser flour absorbed less oil.

The new stoves in Solakhapur required new smaller cooking pots with flat bottoms. In other countries this has led to the rejection of the stove yet in Nepal the traditional chulo stove often blackened and ruined pots calling for the constant need to consume new pots, apart from the initial investment the new technology reduced attendant consumption demands.

Technology and Characteristics within Nepal

Land, Capital and Labor

Predominantly the technologies are agriculture related and thus involve large amounts of land. The women are able to access land but retain little control over it. Most of the land is male owned. The Muluki Ain (Public Law) debar women from inheriting parental property (including land) unless they remain unmarried up to the age of 35; over half the average life expectancy of a Nepali woman. If after this age a women does get married she then has to relinquish property once deducting wedding expenses.

The men tended to have more control over financial capital and since the inherited property was registered under their names they commanded the collateral needed to qualify for loans.

Men also held more control over the labor force than women since they retained more control in the financial sphere. Some women had joined labor unions, often mostly made up of women, but the leaders still tended to be men.

Mechanical, Chemical or Biological

Most of the technologies introduced in these case studies were originally designed for, and entertained, a mechanical purpose. Designed therefore to overcome the physical constraints of man they were often highly capital-intensive as opposed to labor-intensive. This created implications for the labor abundant villages. Women thus lost out in the competition for the few jobs. The technologies which were created for a chemical purpose were more labor intensive, such as the briquette stove, and thus created more labor opportunities for the local women.

Skills, organization and co-operation

The skills, organization and co-operation needed for many of the technologies were not very complex. Only those technologies which were rented out by the day or hour involved organization because the operator and the recipient of the service were different parties and thus needed to come to an agreement on timing, price and location. Few technologies involved group mobilization other than the tractor because of its varying component parts involved in the cultivating activity chain.

The traditional technologies often involved more co-operation and organization as instanced with the khol, which required planning and agreement between the different parties two to three days in advance of the task of chiuri processing.

T.T. also called for an accompanying shift in the skills required to perform the same activity. In the case studies explored these skills did not deviate far from the original skills required or if so, were easily gained locally through informal channels. For instance, tacit knowledge transfer by the tractor drivers in Bandara bypassed the highly institutionalized mechanisms used to acquire an official license. The only exception was the training provided to community members in Shaktikhor, who with the assistance of a local NGO travelled to Butawel in another district to learn how to operate the milling machines.

Findings beyond the framework

Anderson attempts to disaggregate the gender division of labor in order to assess the impact which technology inflicts on women yet she neglects to disaggregate the different social groups which make up women as a category. She treats the heterogeneous as homogenous and thus misrepresents those within this social group.

She makes assumptions about what is negative and positive for women yet neglects to ask the women themselves as to what they conceive are the negative and positive aspects. For instance, the women within Bandara were split between those who liked the new tractors and those who disliked the new tractors. The Dalit women, who also were the most resource poor, argued that because of their lack of land and capital resources they were dependant on wage labor which was being replaced by the capital intensive technology and because of their lack of political capital and resources of status or authority they were not represented in the decision making processes or skills training on new project interventions. The upper caste women however advocated that the new tractors were better since they reduced their

dependence on wage labor and reduced their daily responsibilities allowing them to relax or utilize their time better for other livelihood activities.

Whilst Anderson examined the change in the timing of an activity brought about with the introduction of technologies a more interesting dilemma surfaced during the research regarding the shift in the 'time as money' metric measure brought with the rental of technologies or their services. Traditionally within Nepal agricultural labor is paid on a daily basis at the rate of Rs 120- 150 (£0.94-£1.18) yet new technologies are usually charged at an hourly or per minute rate for their service. Those who are illiterate, usually the poor, elderly and women, are thus unable to read the numbers on a watch and estimate time accurately. When farmers were hiring the tractors in Bandara this created difficulties and rising costs for those who went over the allocated time and often illiterate farmers were exploited and told that they had used the service for longer than they really had in order to squeeze a little extra profit out of them.

Underpinning Anderson's framework is the liberal paradigm in which a woman's (actual and potential) productive contribution provides the rationale for allocating resources to her. Gender equity has become synonymous with economic efficiency. The approach attempts to highlight potential constraints which need to be removed in order to incorporate women into the system of 'growth'. This 'integrationist' approach therefore entertains practical gender interests instead of attempting to transform social inequalities.

Under Anderson's analysis it appeared that the amplified demand for agricultural intensification had increased the labor hours needed to do the task of weeding, primarily the ambit of women this shift appeared to increase the opportunities for remunerative return. However, the change in agricultural production also brought a change in labor arrangements and associational ties. With the halo plough women would often work over a few days on an informal contract yet with the new tractors, landlords no longer provided the assurance of secure work. The heavy intensification of agriculture meant that the number of labor days was reduced for the local women. Tharu workers from across the border were brought in and more people worked the same land within one day. The landlord was still paying the same amount because although more workers were doing the work the amount of labor days had reduced, reducing the opportunities for the local women.

In Jugedi the most interesting outcome from the new technology was not the freed time given to women from the tiresome task of grinding the Janto every morning but the increased

mobility women gained as a result of the shift in locus. The local community members had said that conflicts had occurred whilst women were waiting for the grains to be milled. Goodman (1999) explains how this term should not be , “... used simplistically and negatively, conflating all conflict with physical violence, conflict can also be seen as having a positive dimension as ‘normal’ forms of social interaction which may contribute to the maintenance, development, change and overall stability of social entities.”(pp.14-15)

The Muluki Ain illustrated how institutional forms can reinforce gender inequality. Only by exploring the underlying roots to this law, to the social dimensions which ascribe the identity of the feminine, however, can we truly understand the internal forces creating gender disparity. A woman is prohibited paternal inheritance on the grounds of her identity or, in this sense, her non-identity. The woman is not considered as an individual but the possession of the father until through the system of marriage she becomes the possession of her husband. The system of dowry payment also illustrates women as an economic burden which has to be paid off by the parents. Her potential value and contribution to the household and society is not recognized and in this sense women are undervalued and inequitably treated.

The law is a continuation of the Mitakhari system and is a reflection of the cultural conceptions of women. The status of a woman is not defined or determined autonomously but in terms of her marital or sexual status; a daughter is not entitled culturally to ‘ansha’ (paternal property) because her status changes with marriage.

The framework provides a descriptive account of male and female activities in an attempt to disaggregate roles, or even the change in these roles, and focuses less on the underlying dynamics of power. It attempts to look at equity in terms of access to and control over physical resources (land, labor and capital) and non physical resources (skills, organization and discipline). She touches only tangentially on the social relations at play and neglects the processes through which ‘intangible’ resources such as status and authority are produced, i.e. access to contacts, symmetrical information, political clout and conscientiousness of comparative deprivation.

Implications for the MDGs

Anderson revealed that while technologies may overcome the physical differences between men and women, the main paradigm still equates technology and modernization with the masculine. It appears that the physical differences between men and women have been swapped for the perceived difference in mental capacity to command technical skills. This is

significant when considering implications with respect to the Millennium Development Goals (MDGs). Direct linkages may be ascribed to the goal number three: to eliminate gender disparity in primary and secondary education. For example, by helping to build the educational base and skill level of both the sexes, girls and women would have more command in the sphere of science and technology and thus the resultant empowerment of women would occur.

However, in Shaktikhor when the new mills were introduced a local NGO provided intensive training to one woman and after her followed another male trainee. After a few months the woman was fired from the mill on the grounds that she was not physically strong enough and the male trainee was recruited instead. Under further investigation, it was discovered that the male and female trainees were actually husband and wife and she had been told to leave the mill in order to fulfil her domestic duties. Although she had the same skills as her husband, she did not receive the same opportunity.

Shiva illustrated the dichotomy between passivity and productivity where nature was perceived as passive and where science encompasses all that which is productive or valued as development. If women are perceived as 'passive' and their status is undervalued to the extent that their parents pay a dowry for their 'burden' then any technical skills which they do adopt may become undervalued as a form of lower or non- science.

Education alone will not necessarily result in better circumstances for women without addressing the underlying causes of gender inequality.

Conclusion

Anderson's framework is illustrative of the international tautology within the women in development approach still incorporated within academic discourse. On the one hand she is conscientiousness not to become technologically determinist and on the other she goes so far as to tangentially skim over the social relations without penetrating the internal dynamics and causes of gender inequality. The title of her work, *The Impacts of Technology Transfer on Women* is also illustrative of this notion of a unidirectional causality.

Anderson' like so much of the current scholarly locution has mistakenly interpreted technology as a given factor of development instead of recognising it as a proxy variable. This has carried through into the discourse espousing science and technology training and calling for gender equity within education. The third MDG is illustrative of this; it does not provide

any deeper guidance as to how gender equality can actually be achieved within society. Prior to equality within education there needs to be gender equality in status and authority so that women and girls can access outlets to fully utilise their skills post and prior to education.

One way to overcome this may be to shift attention away from goal setting and focus more on forming guiding principles. The former posits a unilateral course of action from the present point A to the desired goal at point x. With little girth the unidirectional path posits little chance for deviation within changing contexts or any opportunity to interknit with other proxies. Principles however provide wider scope and uninhibited to universal doctrines they can be crafted to be context-specific. This wider girth would also overcome the narrow focus on variables of development and shift focus onto the underlying working dynamics causing inequality.

A guiding principle could form around the idea of the promotion of gender equality and representation. A general theme, in which space is created for women to analyse their own situations and dictate a course of action based on their own experience and on their terms.

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