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Water rich, Resource Poor: Intersections of gender, poverty, and Vulnerability in newly irrigated areas of southeastern Turkey

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ABSTRACT

The provision of water for drinking and irrigation is often assumed to alleviate poverty, though results are likely to be mixed for different individuals. This paper examines the intersections of gender poverty, livelihoods, landlessness, and related considerations in the context of large-scale water development in Turkey's Southeastern Anatolia region, particularly exploring what such an analysis allows for an understanding of variable and differentiated effects of ongoing changes. Findings suggest that certain populations experience enhanced vulnerabilities, and considerable losses, in addition to any gains and benefits of ongoing changes (particularly landless, poor, some women, and those who previously engaged in animal husbandry). This discussion enriches a growing gender and water literature, arguing for an intersectional analysis that understands gender as necessarily conditioned by poverty, livelihoods, and other factors. Further, I argue for the need to further enrich analyses of differentiated benefits and vulnerabilities of water-related changes through consideration of geographic, spatial, and place-specific dimensions.

Keywords: Gender, Water, Irrigation, Poverty, Development, Middle East, Turkey

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1. INTRODUCTION: POVERTY, GENDER, AND SOCIO-SPATIAL INTERSECTIONALITIES

Ensuring water access, particularly for impoverished populations and those vulnerable to water-borne illness remains a considerable challenge, as highlighted by the Millennium Development Goals and numerous development efforts worldwide. Apart from drinking water concerns, development programs have also focused considerable attention to irrigation provision, often viewed as pivotal to increase agricultural productivity, to augment income in rural areas and to meet food requirements. Responding to these concerns in relatively impoverished rural areas of southeastern Turkey, state planners have prioritized provision of affordable freshwater for both domestic and agricultural uses, with the declared goals of improving income and well-being of populations living there. However, outcomes related to water provision need to be examined in detail, particularly given evidence from other contexts that irrigation provision, in particular, may actually exacerbate threats to health and well-being for some.

The research presented here provides a detailed analysis of interlinked water delivery efforts in southeastern Turkey. I make three general contributions apart from the insights specific to the Turkish context. First, the case study reinforces findings from other contexts related to the potential for irrigation delivery to exacerbate vulnerabilities for certain populations. Specifically, processes of gender/social differentiation, access issues linked to landholdings, and marketization of agriculture all condition differentiated benefits, and vulnerabilities, of irrigation delivery. Second, while a growing 'gender and water' literature has drawn attention to gender differentiated effects of variable water conditions, uses, and access; there remains a pressing need to theorize such connections with greater attention to intersectionality—particularly to highlight linkages between gender and poverty, but also drawing connections to other processes of socio-economic differentiation (e.g. landlessness, ethnicity, etc...). Third, I argue for the need to enrich understandings of geographic and spatial underpinnings of differentiation related to water use, access, and vulnerability. Even as I am only able to make partial progress in relation to this last point, there is a compelling need to more fully connect processes of social and economic differentiation to spatial, geographic and place-specific elements that condition vulnerabilities and benefits of resource use and access. Related to this, analytics with respect to changing water conditions, use, and access, must also grapple with connections between drinking water and irrigation, as these resources are often linked hydro-geologically (Sneddon, Harris, Dmitrov, *et. al.*, 2002). I draw several connections between domestic and irrigation water issues in the context of Southeastern Turkey to make this point.

Highlighting these arguments through explanation of ongoing waterscape changes in southeastern Turkey, this work is consistent with, and contributes to, considerable political ecological and environmental sociological works that highlight socio-spatial difference *vis a vis* benefits and vulnerabilities associated with resource conditions, uses, and access. In particular, there has been considerable attention to ways that men and women are situated differentially with respect to environmental and resource

conditions, access, or management (for example, studies by Agarwal, 1988; Carney, 1993; Rocheleau, Thomas-Slayter, & Wangari, 1996; Schroeder, 1999). Related to domestic water, gender differentiated labor expectations with respect to water procurement and care for sick family members make it clear that gender analysis is essential to understand uneven consequences of water quality or access. Concerning irrigation, the tendency for irrigation technologies and corresponding cash crops to be associated with men or notions of masculinity has resulted in frequent exclusion of women from irrigation benefits and management institutions (e.g. Ahmed, 1999). Indeed, a number of case studies have suggested that irrigation-related changes have led to increased work burden, changing status, or assertion of men's control over land and laborⁱ --all potentially worsening conditions for women (e.g. Pangare, 1998). Even as contributions along these lines necessarily highlight context-specific pathways through which gender becomes central to understanding differentiated water resource geographies, there is a clear need to consider women's and men's relative social status, work burdens, and participation in planning and implementation of any water related development effort. Failure to do so not only risks ignoring variable effects of such changes for certain populations, but some have also suggested that the marginalization of certain segments of the population may undermine the benefits or sustainability of such projects over the long term.ⁱⁱ

The approach taken here validates the interest in gender analysis to decipher differentiated benefits, and vulnerabilities, in relation to changing water resource uses and conditions. It also contributes to these discussions by underscoring intersections of genderⁱⁱⁱ and poverty, in particular, as part of a broader set of processes of socio-economic differentiation. Given specificities of the Turkish context, the discussion of gender necessarily unfolds in relation to other axes of differentiation, including landed/landless, as well as particular vulnerabilities as agricultural economies shift to cash cropping. Thus, analyzing social differentiation and vulnerabilities related to water uses and access in the case study context spotlights gender processes as key, but avoids facile assumptions that women are 'the poorest of the poor' (Jackson, 1998), and deliberately links to other processes of differentiation consistent with debates related to 'intersectionality' in the feminist literature (cf. Fincher, 2004). Highlighting an intersectional approach, my overarching goal is to unravel the distinctive nature of (dis)advantage for both men and women, necessitating attention to *diverse and interlinked* processes of socio-economic differentiation (e.g. poverty, landlessness, livelihoods, ethnicity) as co-constitutive, rather than as analytically separable.

An additional contribution of this work relates to the interest in an explicitly geographic approach to these questions. For water resource questions in particular, it is imperative to not only to consider how populations are differentially situated with respect to livelihoods, or gender, but also in relation to spatial and geographic attributes and interrelationships (e.g. upstream or downstream users, or in relation to the particular hydro-geography, see also Crow & Sultana, 2002, Sultana, 2007). While I am only able to highlight a few elements of the specific geography and topography in relation to the case study example below, there is a clear need for work of this type to bring more of the physical and hydrologic specificities to bear on analyses.

Turning now to a case study example of irrigation transition in the Harran plain of

Southeastern Turkey, I delineate these contributions through focus on linkages between socio-spatial difference, particularly connections between gender and poverty. Initial evidence from this pilot irrigation area has shown that developmental goals are being met, with average incomes having increased by as much as three times in the first year of irrigation alone (Ünver, 1997). What other changes have occurred with the emerging irrigated economy, particularly with respect to poverty, gender, and other dimensions of socio-spatial difference? More critically, how are these changes conditioning particular vulnerabilities for segments of the population?

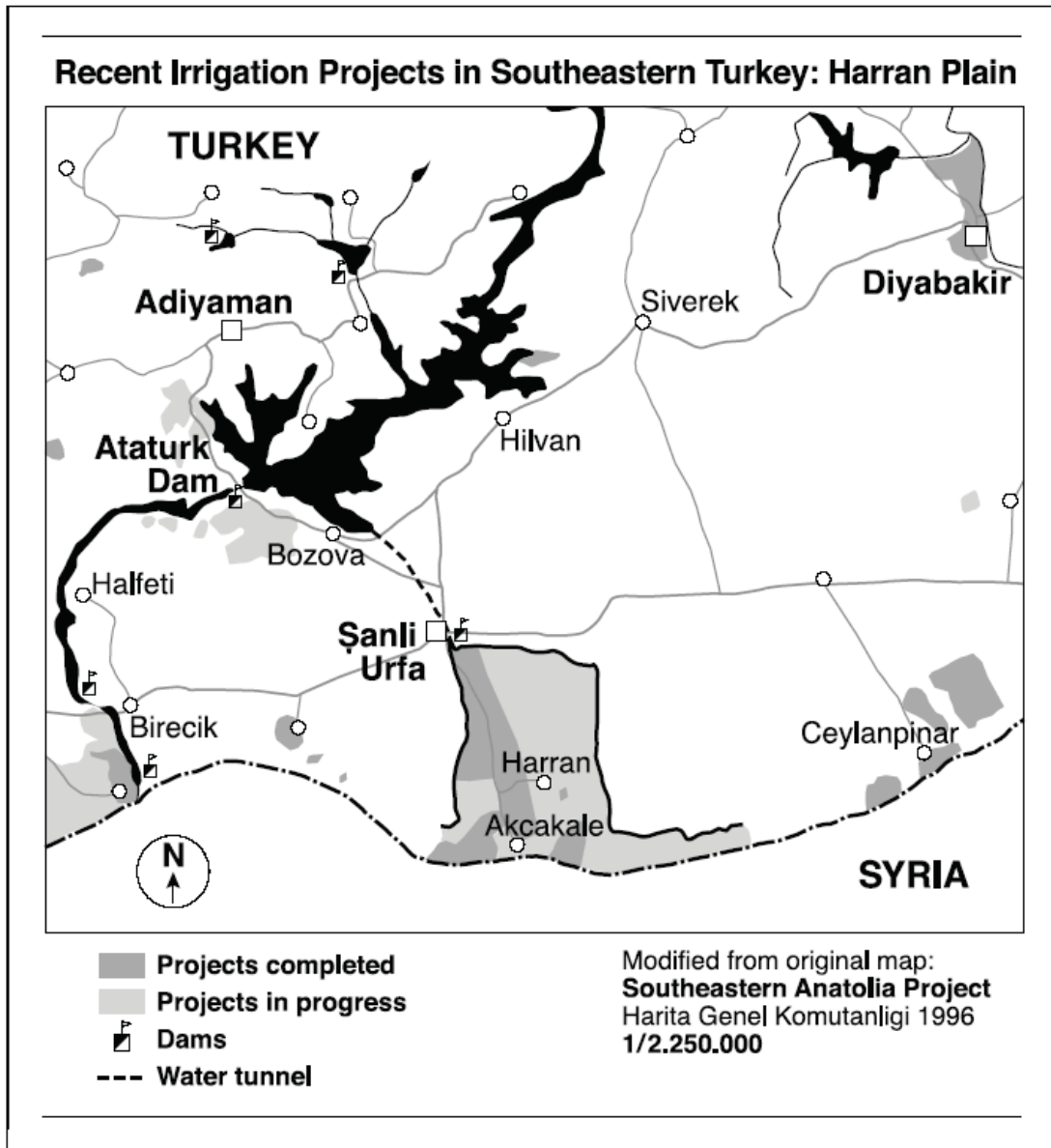
2. CONSIDERATIONS FROM SOUTHEASTERN TURKEY

(a) Water resource provision to impoverished areas

In response to conditions of relative poverty and underdevelopment in southeastern Turkey, the Turkish government has made impressive investments in massive infrastructural works and social programs in the upper Tigris-Euphrates basin as part of the Southeastern Anatolia Project (GAP).^{iv} As comprehensive discussion of the case study context and the GAP project is well covered elsewhere (see Çarkoğlu & Eder, 1998; Oklahoma State University Report, 1999; Ünver, 1997; Harris, 2002), here I provide only a few brief notes. Southeastern Anatolia is among the poorest regions in Turkey, is characterized by high rates of natality (roughly double the national average), and is the only region of the country estimated to be majority Kurdish speaking (though many residents speak Turkish as well, and the region is also home to Arabic speakers and other minority populations). The Southeastern Anatolia project is a large-scale water development project that includes hydroelectricity generation to help meet Turkey's rising energy needs, social development programs that target high rates of illiteracy or entrepreneurial training, and water diversion from the twin rivers for irrigation. While state planners expect that provision of drinking and irrigation waters to populations in the region will address poverty and well-being concerns, the potential for adverse effects of water provision must also be explored, particularly during the early stages implementation. Doing so offers the best hope in allowing planners to mitigate negative outcomes of water related changes. In-process monitoring studies of this type, are crucial for vulnerability studies (Turner, Kasperson, Matson *et al.*, 2003; Smit & Wandel, 2006), to illuminate what potential vulnerabilities new resource conditions and uses might expose, or entrench, so that these may be explicitly addressed as part of ongoing project planning and implementation. It is clear that provision of safe drinking water has many benefits (see Ünver & Gupta, 2003), particularly from a gender perspective. However, it is also important to acknowledge the domestic water provision is part of a much larger, and complex, geography of changing freshwater provision associated with irrigation. Therefore, expected and achieved gains, particularly for women, from improved domestic access must necessarily be read through irrigation delivery and its differentiated effects. For much of the discussion that follows, I focus on transition to irrigation as one of the primary intended benefits of the water related development project for rural populations in the southeastern region.

The first area to receive irrigation waters beginning in 1995, the Harran Plain (see Map 1) has been studied from a number of perspectives as a 'pilot' irrigation area, representing approximately 10% of the nearly 1.7 million hectares that will eventually be irrigated with waters diverted from the Tigris and Euphrates rivers (see Ünver, 1997; Oklahoma State University Report, 1999; Ozdoğan, 2006). GAP goals with respect to irrigation delivery include expectations that income among residents, livelihood possibilities, and crop diversities will all increase in the coming decades. There has in fact been evidence that average incomes in pilot areas of the plain have increased, from an estimated \$1034 to \$3963 in the first year of irrigation delivery alone (Ünver, 1997: 466). However, aggregate income figures related to irrigation benefits do not allow us to decipher the distribution of these gains, especially among different segments of the population (cf. Sen, 1988). Have all residents of the plain benefited from provision of irrigation water? Why or why not? What can we learn through more textured analysis of the differentiated benefits and vulnerabilities associated with these changes?

MAP 1: Pilot Irrigation Area: Harran Plain



The Harran Plain, framed by the city of Şanlıurfa in the Northwest corner, and by the border with Syria to the south, is among the first areas of the Southeastern Anatolia region to receive irrigation waters as part of the GAP project. The plain is populated mostly by Arabic (and Turkish) speaking residents, with some villages also speaking predominantly Kurdish. Prior to widespread canalet irrigation, wheat, lentils, and barley were the primary crops (34, 20, and 19 percent respectively in 1986), with many farmers also maintaining large herds of sheep and goats as supplemental or alternative sources of income. A small number of farmers were also pumping water to irrigate cotton fields, as indicated by 1986 figures that cotton represented 2.7% of the crop pattern in the plain in that year (Ünver, 1997). Based on 1990 census figures, the population of the plain is estimated to be 86,000, with projections for the year 2027 at 230,000 (expected growth is primarily linked to natality rates of above 4 in the region, Oklahoma State University Report, 1999).

Based on field-work conducted in 2001, 2004, and 2005,^v there is evidence that in fact, with irrigation, many residents of the plain, particularly women, the landless poor, and those who were heavily engaged in animal husbandry have experienced important losses in addition to gains. Namely, expenses for many have increased to the extent that they outpace income gains; for some, livelihood options have been constrained; and for many, work burdens have increased dramatically with introduction of irrigation and related crop changes (most significantly predominance of cotton, now reaching 90% of the crop pattern of the plain. See Şelli & Koral, 2000 for a discussion of changing crop patterns). I focus on these issues in turn, particularly with reference to the intersection of poverty and gender concerns. Evidence provided cannot be read as applicable to all residents; however, the trends are significant enough to merit attention.

(b) Socio-economic effects of irrigation in the Harran Plain

Among residents interviewed and surveyed, the majority confirm that they are experiencing increased income. On another positive note, residents note trends of no longer having to travel to far away places like Adana for agricultural work, and also trends of other family members and residents returning to villages with new work opportunities associated with irrigation (for example, with 69% of survey respondents note that in recent years, residents are returning to the village for work, providing a shift that is likely to be significant in the context of the past several decades of extensive rural-to-urban migration in Turkey). Perhaps related to these changes, respondents also had a very favorable perception of the effects of irrigation generally, with 74% noting that irrigation has either been ‘very positive’, or ‘positive’ for their village (see Tables 1 and 2 below). By contrast, only closer to 10% suggesting that in general, irrigation has been ‘very negative’, or ‘negative.’ Such successes are noteworthy, however, as noted, further analysis is required to contextualize these changes.

First, while the overall sense of irrigation-related changes is positive, this is not a sentiment shared to the same degree by all residents. For instance, only 1/3 of poor women^{vi} note these positive associations, in contrast with 3/4 of the population overall. Second, residents note that while their income has increased, so have their expenses, minimizing the real benefit of income gains. Third, those who had previously been engaged in animal husbandry, many of whom are also landless and among the poorest rural residents, have also experienced significant losses in terms of lack of access to grazing lands since irrigation given the emerging cotton economy of the plain. Fourth, work burdens generally are increasing, especially for women and children, a change that was in fact anticipated by GAP planners (based on interviews with GAP staff, Harris, 2001). I consider each of these issues in turn to decipher differential effects for populations of the plain.

TABLE 1: Survey responses to the question:

In general, how would you characterize the changes irrigation has meant for your village?

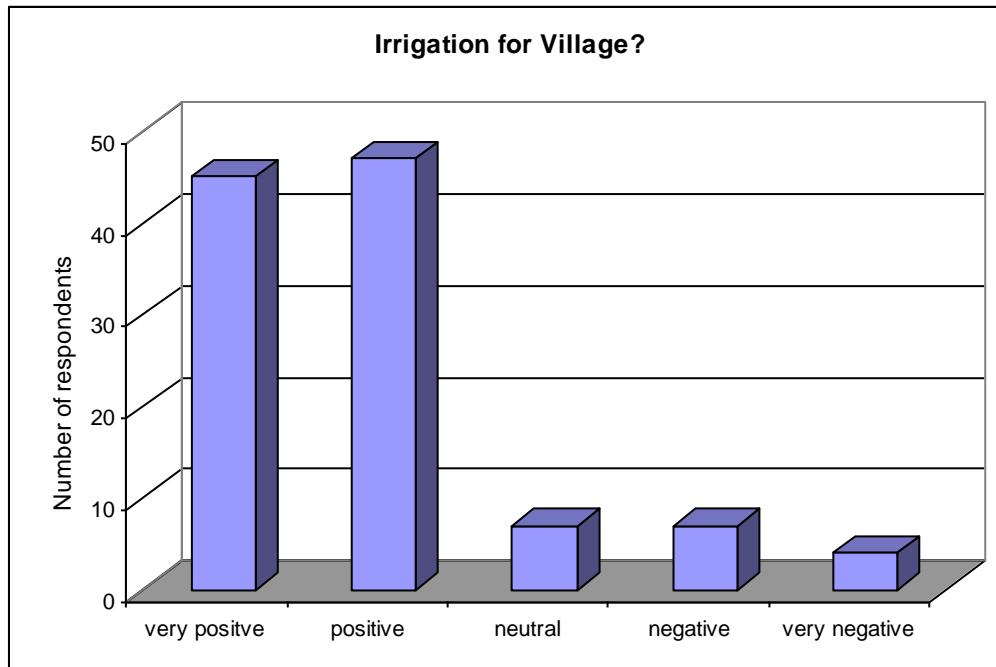


TABLE 2: Socio-economic breakdown for responses to the question:

In general, how would you characterize the changes irrigation has meant for your village?

Percentage of respondents answering either 'very positive' or 'positive' indicated.

	Overall	Kurdish speakers	Arabic Speakers	Middle Income	Poor residents	Landed	Landless
Men	80.22%	88.89%	78.33%	88.14%	68.18%	91.49%	70.73%
Women	57.58%	75.50%	50.00%	66.67%	33.33%	78.57%	44.44%
Total	74.19%	80.00%	70.73%	82.72%	58.97%	88.52%	62.71%

Among other interesting differences related to perception of irrigation-related benefits noted in Table 2, men tend to be more positive than women; more well-off residents tend to be more positive impoverished residents, and landed residents tend to be more positive than the landless.^{vii} The segments of the population that indicated the lowest

positive associations with irrigation related changes, poor women (only 33%) and landless women (44%) serves to justify my particular interest in unraveling intersections of gender and poverty. What are the mechanisms (e.g. gender, poverty, landlessness) that help to explain differentiated experiences of irrigation-related changes for different segments of the population in the plain? I now turn to an analysis to unravel some of these issues.

(i) Real income gains?

Of survey respondents, 65% considered their economic situation to be ‘normal’ (or middle income), closer to 31% considered themselves to be ‘poor’, and 2% of those we spoke with considered themselves to be ‘rich.’ This provides a general indication of how the respondents viewed their situation relative to others in the same geographic area.^{viii} The self-reported economic situation among residents needs to be understood given the situation of the plain as a whole—one of the poorest regions of Turkey. Consistent with earlier studies on changing economic trends associated with irrigation in this area, the majority of survey respondents, 77 % of male and female respondents,^{ix} noted that their income has increased since transition to irrigation, while only 2.5% responded that they have experienced a drastic income decline. However, when asked how expenses have changed with irrigation, over 70% of respondents claimed that their expenses have ‘increased considerably’ or ‘increased slightly’, compared with only 4% saying expenses have decreased.^x Among the few respondents who noted a decrease in expenses, several of these farmers said their expenses are less now because they have lost their livelihood (especially associated with animal husbandry), have significant debt, or cannot afford to make purchases (therefore, noted decreases do not necessarily imply that costs of living have gone down, but may also indicate increasing inability to meet expenses). Common expenses many cite as having increased dramatically over the past decade include costs of sugar/ tea and other expenses for the home, drastic increases in bride’s price (*başlık parası*, or the cost of obtaining a bride), as well as agricultural costs (including expensive seeds and pesticides for cotton that are often imported, with farmers purchasing these imported goods in foreign currency terms despite the weakening Turkish lira just after the 2001 financial crisis).

There is also clear and visible evidence of some families having experienced increased wealth since irrigation, with some residents claiming that they have been able to travel on the hajj with new irrigation wealth, that they have purchased new models of cars, or have been able to purchase second or third wives. Among female respondents, there are also wives of rich farmers who note that they no longer have to work outside the home, or now enjoy newly constructed cement houses. As one 29-year-old man expressed, changing material conditions associated with irrigation wealth are evident across the plain, “the houses changed. New houses are being built. Most people bought cars. Everyone found a job of some sort” (Survey, November 9, 2001). Among fairly well-to-do farmers, based on initial gains associated with irrigation, these residents may have taken out loans to invest in new agricultural seeds or technologies associated with cotton production and irrigation. These loans, in addition to the seeds, fertilizers, and pesticides needed for cotton production on an annual basis, are most often in foreign currency terms, notably U.S. Dollars and German Deutschmarks. With the

falling Turkish lira, at all time lows during the 2001-2002 time frame when the initial research was conducted, some farmers now face impossible hurdles in attempting to pay back these loans. To illustrate this, in 2001, a kilo of cotton sold for 450,000 TL, only 50,000 TL more per kilo than the prior year, or an increase of 12%. During the same time period, the exchange rate went from approximately 600,000 TL to the US Dollar, to 1,400,000 and higher (therefore the price received per kilo remained relatively constant, though the lira was devalued to less than half in foreign currency terms). Some farmers noted that they had impressive earnings from cotton in the first several years, but now, given falling production (for example, connected to virtual mono-cropping of cotton and associated pests), coupled with the severe financial crisis that has plagued Turkey over the past several years, they find themselves saddled with debt. For example, Salih^{xi} notes, “In the past we didn’t have much, but at least we didn’t have debt.” Given these factors, it is clear that the timing of bringing this region more fully into cash crop production and market reliance has been extremely unfortunate, having the overall effect of making all farmers, regardless of landholdings or relative income, increasingly vulnerable to market fluctuations. Although to some extent this vulnerability touches all farmers engaged in cash crop production, unquestionably, the poor and landless are most vulnerable to such shocks without income and resources to fall back on.

In addition to the upper or middle-income farmers of the plain who now may have significant debt, a number of landless and poorer farmers also complain of increasing indebtedness, more often to family and friends since these farmers would be unable to access credit without formal title to land. This debt may be to meet large expenses such as those associated with a marriage. For example, Zena, an older landless Arabic-speaking woman complained,

Irrigation has been bad for us. It is only good for those who have land. For those without land, like us, it did not bring anything... We work here, but what we get at the end of the cotton harvest is not enough even to cover our debt. We have twice as much debt as we’ll earn from this harvest. (Interview, October 14, 2001).

Ayça, a Kurdish speaking woman in her forties, similarly noted a sense of deepened relative impoverishment, specifically with respect to a perceived widening gulf between rich and poor in the plain. She lamented, “Irrigation was not good. We were left more backward,” specifically referring to a perceived divide between those with lands, who gained from irrigation, and those without lands. She continued, those with lands, who became rich after irrigation, “did crazy things, buying unnecessary, lavish, things, they only became interested in buying gold, cars, and quarrelling over money” (ibid). The sense of both respondents, that they are relatively worse off than before, is informed by indebtedness increasingly common for many residents, rich and poor; the increasing cost of living in the plain associated with the new wealth experienced by some (driving up market prices for some essential goods); the increased incidence of visible status items such as cars that many have purchased since irrigation (enforcing the feeling that they are ‘relatively worse off’ compared to gains that others have experienced), and

importantly, increasing land prices since irrigation has also meant that for the landless, the ability to purchase agricultural lands is increasingly out of reach. Even more important for some of these landless families, the transition from subsistence to market cash-crop production has meant increased inability to meet family needs off-market, driving up the imperative to earn and spend money.^{xii} In addition to the general statistics that indicate that poor and landless residents are less positive about irrigation in general (see Table 2), there were several other survey responses that illustrate such divides. For instance, 46% of impoverished residents agreed with the statement ‘Our life was better before cotton’ compared with 39% of middle income residents. Similarly, 47% of landless agreed with this statement compared to 36% of landowners (it is notable for all of these groups, however, that a majority disagreed, indicating that life *was not* better previously). Another question asked directly if everyone benefited equally from irrigation. The responses here are also telling with 54% of women agreeing, less than the 64% of men who agreed. Three quarters of landowners agreed that benefits have been equal, compared to closer to half of landless interviewees. These statements seem to affirm a differentiated sense of the degree to which benefits have been equal, even as a considerable segment of the population believes that the benefits have been shared equally.

(ii) Constrained livelihood options? Effects for the landless poor

In many respects, landless residents of the plain are among the most impoverished, therefore an analysis attentive to differentiated effects of irrigation must consider the particular situation they face. Based on responses to our survey conducted in eleven different villages of the plain, 72.5% of respondents identified ‘problems related to unequal landholdings’ as important for their village. In fact, only 47% of survey respondents identified as ‘landowners’, with the remainder either identifying as sharecroppers (26%), renters (5.7%), or without access to lands altogether (15.4%), indicating a relatively equal number of landed and landless residents.^{xiii} This is generally consistent with official estimates of landlessness in the plain, with figures citing approximately 37 % of residents of the plain as landless several decades ago, with the suggestion that this figure be closer to 25% of residents more recently (Ünver, 1997). Whether the precise percentage is 25% or 50%, particular interrogations of the relative gains and/or vulnerabilities of this population relative to irrigation merit consideration.

The majority of landless farmers work as sharecroppers, most often providing all labor inputs for crop production for a 30% share of the earnings. Prior to irrigation, many of these farmers similarly worked as sharecroppers, either growing cotton in other regions of Turkey (such as nearby Çurkova) or growing wheat, lentil, barley, and other crops closer to their villages near Harran. As noted, prior to canalet irrigation, animal husbandry often represented an important supplemental or alternative livelihood strategy, particularly for those without ownership of lands. In conversation with Zena (the older landless Arabic speaking woman cited above), she reveals that one of the primary reasons they believe themselves to be worse off than previously is that with widespread cotton production, they are no longer able to graze animals, losing a primary source of their income and sustenance. She continued, “We want to raise more

animals, since it was very profitable, but the landowners don't let us do it. They say the animals destroy their crops" (interview, October 14 2001). Prior to irrigation, the seasonal production of wheat, barley, lentils and other dryland or subsistence oriented crops meant that there were often fields available for grazing. Now with planting of cotton in the summer months, and nearly all lands coming into production, it is more difficult for families such as Zena's to continue herding. The crop shifts from dryland staples to cotton has other implications for subsistence as well. In the past, bread was made from wheat; lentils, barley and other pulses provided basic nutrients; and milk, yogurt and meat from sheep and goats offered protein sources (not to mention wool and other associated benefits). Additionally, with animal herding, women including Zena and her daughter-in-laws would sell surplus cheese and yogurt for additional family income.^{xiv} As Zena's son added to the conversation, "You can benefit from every part of the sheep, its milk, its cheese, you can sell its offspring, its wool. You can also make pillows, beds with its wool. We would sell the meat. Irrigation has served those who have land. Those others like us have to pay lots of money, 30 million TL to rent a donum of land, and buy a ton of fertilizer for 250 MTL, you have to apply fertilizer twice, and give pesticides, and what is left to us at the end is just a little bit of money not even covering our inputs for the land" (ibid). In short, landless families such as Zena's now must farm to earn cash income, and then must buy many of the items that they formerly produced themselves (including milk, yogurt, wool, or even flour). While some residents had very little income prior to irrigation, the fact that they were meeting some basic needs on a subsistence basis meant that certain essential needs were still being met, even if some market-based goods such as health care remained out of reach. While the quotes above related directly to the situation of that particular landless family, similar statements were made repeatedly by many others living in the plain, especially among landless farmers who had previously relied heavily on animal husbandry. As another landless Kurdish speaking respondent noted, the GAP project has been like a 'suicide pill for animal breeders,... it prepared our end' (Harris, 2006). The two graphs below compare the responses given by respondents comparing animal holdings of ten years ago (Table 3, just prior to irrigation, totaling 6000 among all respondents), with today (Table 4, total of approximately 700 head among all respondents), illuminating a situation of drastic decline.^{xv}

TABLE 3: Reported Small Animal Holdings, 10 years ago (Total number of sheep and goats)

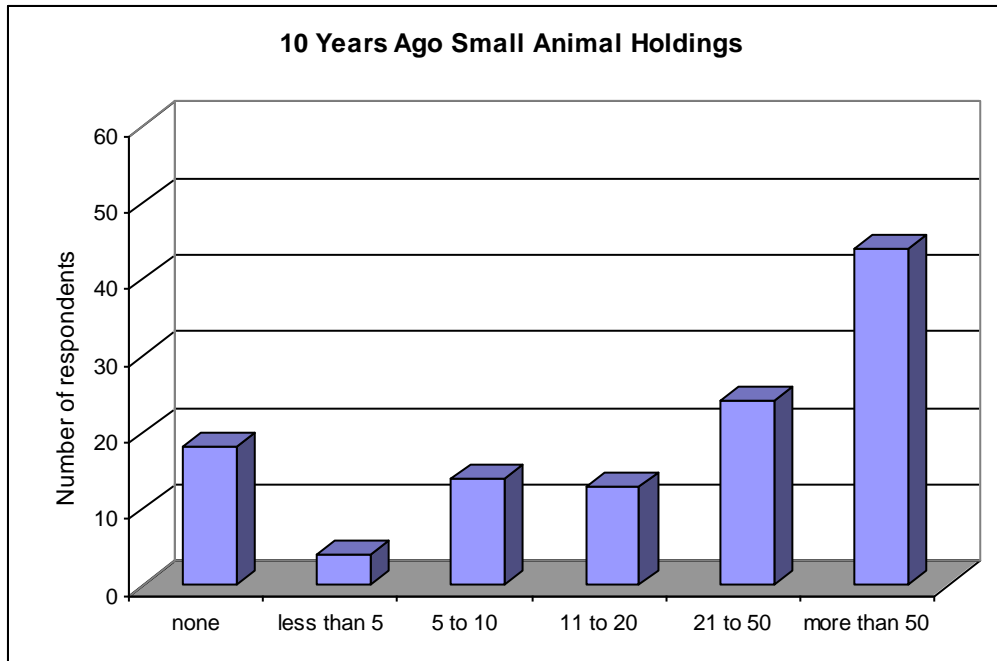
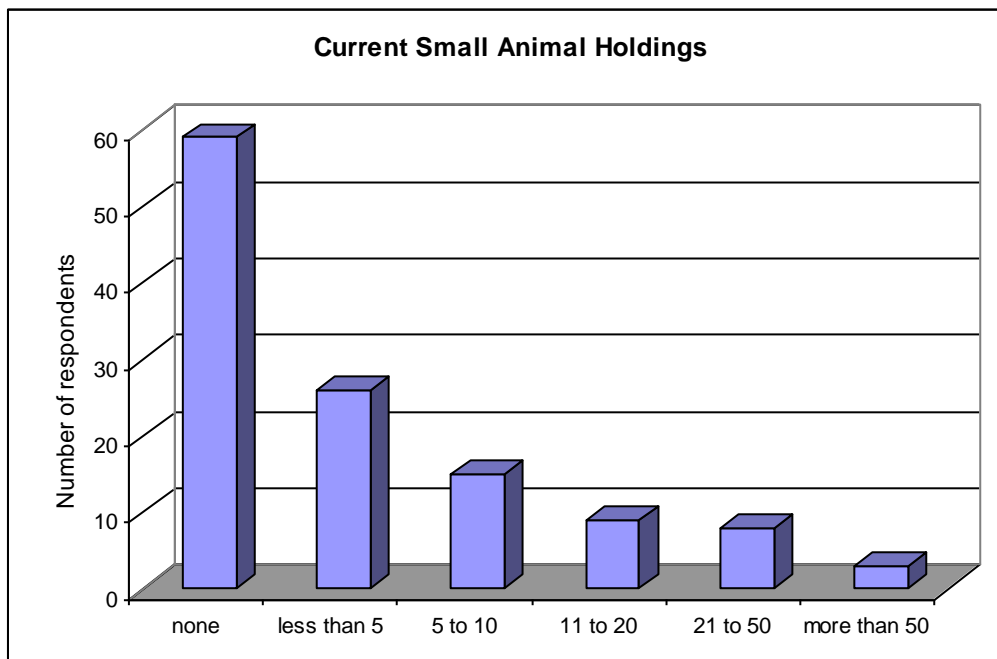


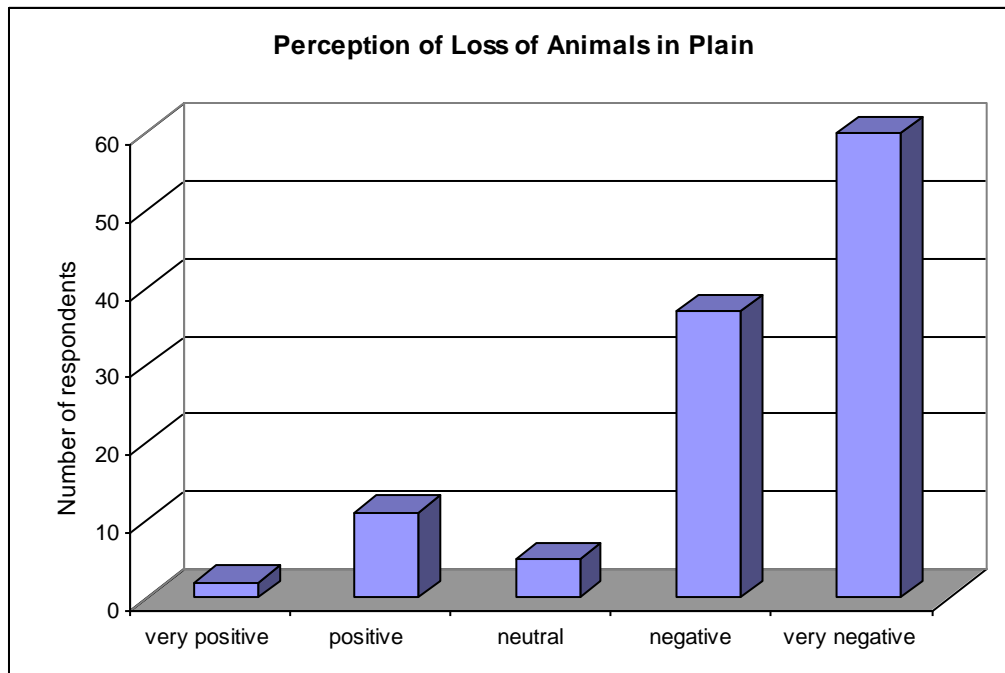
TABLE 4: Reported Small Animal Holdings, 2001 (Total Number of Sheep and Goats)



In contrast to the overall positive association with irrigation that was conveyed by many, survey respondents indicated a largely negatively association of the loss of animal herds on the plain. Specifically 85% of respondents noted that the “reduction of the numbers of animals in the Harran plain has been ‘negative’ or ‘very negative,’” while only 10% noting the change has been ‘positive’ or ‘very positive’ (see Table 5, below). Different populations also emphasized this negative association differently. For instance, poor interviewees responded more negatively (87% compared to 77% of middle income interviewees). Also, not surprisingly, those who had animal holdings ten years ago responded more negatively (85%) than those who did not have animals prior to irrigation (64%).^{xvi} Besides the loss of land for grazing with irrigation implementation (the major factor indicated), other reasons that respondents noted for selling their herds included economic pressures, for example health costs among family members. As one survey respondent noted, prior to irrigation “I had 25 sheep and no debt, but cotton came and expenses increased, and income decreased.” Another respondent, a 34 year-old male, echoed the other statements, “the water came. The animals became nonexistent. My living became more difficult. It is related to the current crisis in Turkey.” This man’s awareness of his connection to wider economic trends in Turkey is a strong endorsement of the statement made earlier about how the poor of the plain are now increasingly vulnerable to market fluctuations and economic trends generally. His statement also underscores the difficulty in distinguishing aspects of these losses specifically tied to irrigation from those related to the persistent economic crisis that has affected Turkey in the years following the 2001 crisis. Within with this broader context of instability, follow up research conducted in 2004 and 2005 affirmed the idea that there is heightened vulnerability in the plain associated with loss of supplemental or alternative livelihoods, also helping to explain why residents of the plain perceive the loss of animal husbandry as exceedingly negative.

These chains of explanation help to unpack part of why poorer residents, landless families, and animal herders are among the most vulnerable to emergent conditions and shifting market economies in newly irrigated areas, and as such were generally less positive about changes in their survey responses.

TABLE 5: Perceptions among residents with respect to decline of animal herds in the plain

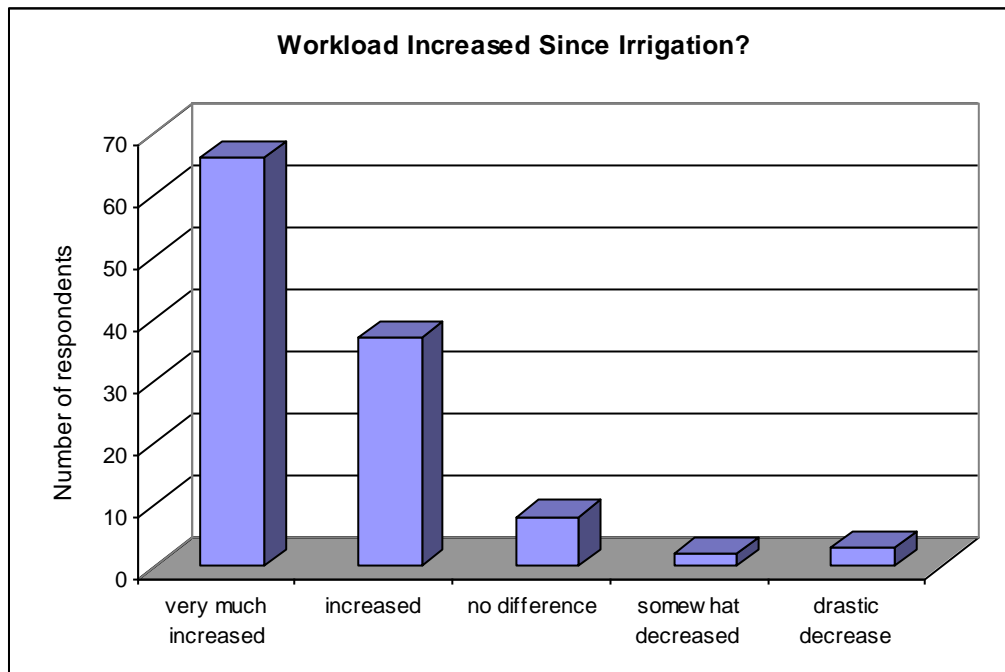


(iii) Increasing income, increasing work burden?

In addition to these heightened vulnerabilities, particularly acute for some, residents of the plain are also working more since delivery of irrigation. Cotton, the preferred crop of the plain (reaching nearly 90% of the cropping pattern) is notorious for being both labor and input intensive. While the overall earnings are considered to be more with cotton (the primary reason that so many farmers are turning to cotton as the exclusive crop, including income from state subsidies targeting cotton), the labor inputs are also significantly increasing, with farmers now engaged in application of pesticides, weeding, and especially the labor intensive harvest during the fall months. Thus, the emerging picture with cotton is that while owners are often paying greater expenses for input costs (e.g. fertilizers or pesticides), the increased labor burden is falling heavily on sharecroppers and seasonal laborers who engage in direct manual labor (again, distinguishing effects for large landowners verses landless sharecroppers). In our survey, the majority of residents, 89% noted that since irrigation their workload has increased (see Table six below, comparison of changing income to changing work burden with irrigation).^{xvii} It is important to note, however, that an overwhelming 78% also noted in a follow-up question that they viewed this as a positive change. Particularly given the high rates of rural to urban migration since the 1960s, this indication affirms that more work opportunities in rural areas are viewed positively by many, and at times celebrated for enabling family members to return to the region. This was in fact part of the impetus for delivery of irrigation water to the region, and was

borne out by my analysis of how different residents experience and interpret irrigation-related changes. In terms of important breakdowns among those who view these changes positively, 69% of men, compared with 45% of women viewed the increasing work burden positively.^{xviii} It is also interesting to note that while equal numbers of ‘poor’ men and women view this as positive (55%), there were marked differences among middle-income populations, 78% of middle-income men compared with only 36% of middle-income women interpreted this as a positive change. It is possible, for instance, that middle-income women aspire to not work in the field at all, while poorer women may not have such status expectations. Taken together, general trends in the plain include changes whereby residents are earning more money, facing greater expenses, debt, and vulnerabilities to market shocks, are working more with irrigation, and are seeing shifts with irrigation generally, and more work opportunities specifically, as welcome changes.

TABLE 6: Overall Responses to question of whether or not respondent’s work burden has increased with irrigation



(c) Distinguishing trends, gender differentiated effects?

In addition to some of the general trends, and particular experiences of landless residents, there are also significant ways that men and women are differentially situated with respect to these changes. Here I return to the major themes of the ‘gender and water’ literature to consider how gender differences in terms of social expectations, work responsibilities, or other dimensions have importance for differentiated

experiences of, and effects of, irrigation related changes. As several of the gender-differentiated responses above indicate, women tend to consider that they are working much more, view the increasing work less favorably, and consider irrigation to be less beneficial than male counterparts. For the most part, findings in terms of the differentiated situation of men and women with respect to irrigation-related changes parallel general issues highlighted by the broader literature. Much of the background, evidence, and analysis related to gender differentiated issues related to transition to irrigation in the Harran plain is provided elsewhere (Harris, 2006).^{xix} Therefore, here I provide only a brief overview of important issues, without attempting to replicate all of the evidence for these shifts. Again, my primary point here is to better theorize the intersection between gender-differentiated shifts, and other dimensions of socio-spatial difference (e.g. poverty, livelihoods, landlessness), rather than to detail all the elements of gender difference in relation to these shift *per se*.

Among the most notable issues from a gender perspective, the labor-intensive harvest of cotton undertaken in the fall months is feminized labor, performed mostly by women and children. Even as women have traditionally worked in the fields to harvest lentils and other dryland crops, their ‘double work burden’ (referring to work in the fields and continuing duties with respect to reproductive work at home) is now likely to be more pronounced with intensified labor requirements in the fields associated with cotton (see also Jordans & Zwarteveen, 1997; Pangare, 1998; Ahmed, 1999 for similar discussion of increasing work requirements for women accompanying transition to irrigation, or mechanization of agriculture). Interestingly, in the Harran plain, there was also evidence that bride’s price has increased with irrigation (perhaps reflective of increasing costs of living in the plain generally, or increased value attached to female laborers particularly). The purchase of status wives (usually the daughters of rich farmers, who tend to command a higher price), or additional wives, is one way that new riches associated with irrigation have been spent, in addition to new cars, tractors, cell phones or other status items. In response to the questions on our survey, ‘what would you buy if you had extra money’ the responses were heavily weighted to new land/houses (35%) cars/tractors (18%), and marriage was the third-most often indicated item (12% of male respondents).^{xx}

Moving away from wheat production and animal herding (with direct contributions from male and female family members to meeting family needs, for instance with women making flour, bread, wool beds, cheese and other contributions as noted), to a cash economy (where market purchases are made by male heads of household), results in a situation where men are seen as contributing more to household needs, with the linked effect of increasing status of male heads of household. There are several additional gender implications related to loss of subsistence production associated with former animal husbandry livelihoods: loss of additional family income earned from selling yogurt and cheese made by women; reduced of ability to process wool in the home (for example making bedding);^{xxi} and changes to family nutrition and meal preparation, especially with potential loss of protein sources from animal meat and milk (in other studies, it has been shown that loss of easily-accessible dairy or meat in diets often most adversely affects women and girls, as male family members are oftentimes given priority for food or protein consumption, e.g. Agarwal, 1992; Kabeer, 1994).^{xxii}

One trend that may at least partially counteract nutritional losses associated with decline of animal husbandry is the new ability to grow fruits and vegetables for family consumption. The majority of farmers, landowners and sharecroppers alike, now have small irrigated plots for family use, growing mostly tomatoes, peppers, herbs, and eggplant, and to a lesser extent, melons and other vegetables. Undoubtedly, these plots also enhance the vitamin content of diets for many on the plain. It would be interesting to specifically evaluate diet and nutrition related changes for residents with the coming of irrigation, an issue that is beyond the scope of this study. It is however significant for the concerns of this paper that these plots tend to be managed by women. While women in particular emphasize the ability to grow fruits and vegetables favorably, they also complain that these crops are not given preference for irrigation delivery. Indeed, the irrigation schedule is determined around cotton needs, meaning that the water stops a month or more before the growing season for peppers and other vegetables would otherwise be over (see also Agarwal, 1986; Zwarteveen, 1995 for discussion of women's crops similarly not being prioritized for irrigation in other contexts). It may be possible for the state water agency (DSI) to consider extending the irrigation delivery season to support continued growth of vegetable plots, particularly given the gender and nutritional dimensions of the issue.

As the earlier responses related to gender-differentiated work burden suggest there is evidence that transition to irrigation has increased work responsibility of women and children,^{xxiii} again replicating familiar patterns that have been observed in other contexts (Jordans & Zwarteveen, 1997; Pangare, 1998; Ahmed, 1999). During the fall months, large work groups come to the Harran plain to pick cotton. Most often these are work groups of women and children, joined by adult men performing manual labor and supervisory roles. Indeed, increasing labor demands on women and children is yet another change that was anticipated by government planners (interviews, 2001). While low rates of school attendance have always been an issue for children in the region, and especially young girls (due to costs of books and uniforms, work requirements, and gender expectations), this is an issue that is somewhat exacerbated with cotton production as now families have additional incentives to keep children out of school through the fall to provide needed labor for the harvest. As I have argued elsewhere, in addition to specific gender differentiated effects of transition to irrigation, there are also shifts with respect to more fundamental ways that gender difference is lived and maintained in the region (again, see Harris, 2006 for detailed discussion of all of these issues).

(d) Critical intersections: gender, poverty, livelihoods, and ethnicity

As the above discussion makes clear, there are certain gender differentiated effects for women and men that accompany transition to irrigation in this context. However, as I have emphasized throughout the preceding discussion, these changes are centrally conditioned, in particular, by relative poverty, landlessness, and livelihood considerations. While on the whole, women are subject to increasing work burden, there is a segment of relatively well-off women who do not engage in agricultural labor at all, and enjoy the prestige of only working in homes. It is important to note that as

these families are often hire sharecropping families, or seasonal laborers, the ability of these women to not engage in agricultural labor necessarily relies on the work of other laborers, particularly female workers coming from other regions of southeastern Turkey. As a reminder, the two segments of the population that had the least positive associations with irrigation overall were poor women (33% viewed changes positively), and landless women (44% viewed changes positively). These stand in stark contrast to the overall positive response rate of closer to $\frac{3}{4}$ for the total population surveyed (and 88% of middle class men, or 91% of landed men, for instance). Emphasizing landlessness, livelihoods, and shifting work burdens and status associations for men and women, I have traced some of the mechanisms that might help to explain some of these important differences.

While I have not provided detailed discussion of ethnicity in relation to these issues, given the demographics and history of this region, this is also an important issue. The issue of seasonal and migrant laborers noted above is a central part of this story. Within the Harran plain, approximately 80% of residents speak Arabic and Turkish, while the remaining residents speak Kurdish and Turkish, and only a very small percentage speaking Turkish only. As such, the plain is somewhat of an Arabic language pocket in the broader Kurdish-dominated southeast Anatolia region. While it is problematic to connect language to ethnicity in a direct sense (see Akşit 1996), the broader history and context of violence in the region related to the Kurdish issue makes issues of ethnicity and identity paramount (see Harris, 2002). Elsewhere, I have argued that there are ways in which terms of difference in relation to ethnicity are in fact shifting in relation to the new resource geography of the region (for instance, with what it means to be a 'Kurd' or an 'Arab' taking on new meaning with respect to labor movements and water access in the southeastern Anatolia region on the whole, see Harris, 2006). With respect to intersections of gender, poverty, and ethnicity, there is no clear way to differentiate effects for populations within the plain, as large landowners or impoverished populations may either be Arabic or Kurdish speakers.

Thus, within the context of the Harran plain, ethnic difference may only provide subtle or ambiguous clues in terms of differentiated outcomes of irrigation related changes. The particular situation of animal husbandry is perhaps one of the few issues that deserves note, as this was a more common traditional livelihood for Kurdish semi-nomadic pastoralists (who historically would summer sheep and goats in the high mountains of the eastern regions, and move down to the plains for the winter months). However, as indicated at various points above, the elements of the survey data that offer me reason for pause for the analysis are precisely those related to different responses among Kurdish or Arabic speaking residents (it is important to note, however, that only two Kurdish speaking villages were included in the survey, and a total of 36 Kurdish speakers were surveyed). For instance, Arabic speakers on the whole view irrigation less positively than Kurdish speakers (78% of Arabic speaking men, and 50% of Arabic speaking women noted irrigation related changes positively compared to 89% and 76% for Kurdish men and women respectively). Similarly, there were certain answers for which the differences between male and female respondents were more stark for one language group (e.g. only 36% of Arabic speaking women thought increased work burden had been positive compared with 73% of Arabic speaking men, the numbers for

Kurdish speakers demonstrated relative parity for men and women). While I have tried at several points to provide some possible explanation for these differences (see notes 16 and 18), the importance of ethnic or linguistic identity with respect to differentiated effects of irrigation in the Harran plain is somewhat unclear.

For the broader scale of the Southeastern Anatolia region the importance of ethnicity is more evident. For instance, some invoke the fact that irrigation was provided first to the Arabic speaking pocket of the Harran plain (rather than to surrounding Kurdish-speaking areas) as evidence for continuing inequality facing the Kurds. Similarly, the fact that seasonal migrant laborers coming to the largely Arabic-speaking plain are predominantly Kurdish-speaking, represents marked seasonal shifts with respect to the linguistic geography of the plain. For Turkey on the whole as well, ethnicity is an issue that has been critical to conditioning situations of poverty. Indeed, the Kurdish Workers party (PKK) has often drawn on relative under-development of the southeast to garner sympathy for its cause among Kurdish populations (see Harris, 2006 and forthcoming for elaborated discussion of these issues).

(e) Other gender-poverty-development linkages

(i) Drinking verses irrigation water

In the previous section, I provided several examples of ways that poorer residents, landless residents, some women, and especially poorer or landless women, may be comparatively less well off with changes associated with transition to irrigation in the Harran plain. As noted above, it is necessary to read irrigation provision in relation to drinking water provision, as these changes are both part of the large and complex effort underway in the region. Drinking water provision to rural communities has certainly been an important aspect of GAP development over the past several decades. As with many other contexts, women in the Harran plain are generally charged with obtaining water for domestic needs, for drinking, as well as for laundry and washing dishes. Many villages of the Harran plain now have access to drinking water with the establishment of village spigots (Oklahoma State University Report, 1999; field notes, 2001).

Undeniably, improved access to drinking and domestic water has the effect of significantly reducing the work burden of women in the region, and often may have positive implications for overall well-being and health (dependent on the quality of available water). There are also many culturally significant and ritualistic associations with water in this context, especially given importance of religious ritual purification related to Islamic practice, meaning that the improved availability of water is a feature with diverse implications for residents of the plain. With state provision of drinking water, some houses now also have in-house access, and for the majority, access to the village spigot is free and abundant. For those villages that still do not have established water supplies drinking water is generally brought in by 'tanker', a large truck filled with water from a nearby area. Even with the gains made over the past several decades in terms of increased access to water for drinking and domestic uses, this is also not an issue without problems. In fact, among survey respondents, 66% identified problems associated with drinking water as an important issue facing their village. Additionally, it was observed on several occasions during my fieldwork that women also use irrigation

canalets for domestic uses, for instance, for dishes or laundry. When asked directly about these uses of the irrigation water, most women recognized that the irrigation water is not suitable for these purposes.

An additional note of caution that must be mentioned with respect to drinking water in the plain is that the groundwater supply from which drinking water is accessed has been significantly affected by delivery of irrigation water diverted from the Euphrates River, sixty kilometers away. Use of irrigation water is effectively recharging the underground freshwater supply, especially with heavy of irrigation waters common during the initial phases of irrigation delivery. Given the transition to cotton production, this also means that the groundwater supply also increasingly contains a range of pollutants, such as pesticides (significantly more than was used with wheat and the pre-irrigated cropping pattern). For rural residents generally, and for women who are charged with provision of domestic water and care of sick family members in particular, this problem may prove significant over the long-term with potential threats to the quality of the drinking water supply and therefore the health and well-being of residents. Even in the absence of threats to drinking water, there are other health effects associated with irrigation, from increasing malaria that has already proven to be an important problem in the plain, illness from other water-borne diseases associated with stagnant water, as well as long-term threats to health associated with pesticide use and application exposure. This last issue again may have also important gender-differentiated effects. With respect to pesticide application, it tends to be men who engage in this labor, with up to a quarter of farmers surveyed noting that they do not take precautionary measures when working with the chemicals. When asked about what sort of precautions others take, some note that they wrap a scarf around their face to avoid breathing in fumes, or note that they eat yogurt before applications. Very few reported using masks and similar technologies. Yet again, these are aspects of irrigation delivery that have differentiated effects for men and women, and for the rural poor generally.

Situating the changes with irrigation in relation to linked issues of drinking water speaks directly to the need to consider hydro-geographic features more centrally in discussions of 'gender and water', or in political ecological studies of resource issues generally. In this case, drinking water, and irrigation provision are linked, and as noted these connections are likely to have consequences for the future water quality and access issues. As further evidence for the reason to consider geographic and hydrologic dimensions, the topography of the plain has created a situation where villages in the southern reaches are suffering the effects of rising groundwater (with irrigation application and recharge). Water is seeping into adobe homes, and forming pools of stagnant water in villages. This situation again highlights socio-spatial differences as key, including particular elements of hydrogeography that emerge as central to conditioning differential effects for residents, exposing yet other dimensions of 'intersectionality' with respect to these changes.

3. CONCLUSIONS

Evidence from the Harran plain illuminates critical intersections, particularly between water, gender, poverty, livelihoods, and landlessness. Many theorists who have been explicitly attentive to gender considerations have at times privileged an analysis of differentiated effects for men and women over analysis that would understand how different men, and different women are affected by water related changes in relation to landholdings, relative wealth, or livelihood considerations. I have engaged evidence from southeastern Turkey both to highlight the need to understand differentiated effects and vulnerabilities associated with water related changes, and to demonstrate the need for fuller engagement with multiple intersectionalities in relation to these issues.

Highlighting spatial and geographic elements as well, I have argued, is likely to be key for nuanced understanding of these issues. Even while I have targeted the gender and water literature as a primary audience for these insights, this literature is already ahead of other approaches in many respects. An even more crucial target for these insights are the many studies that fail to differentiate effects of water-related development interventions all together. Too often, men and women, or landed and landless are assumed to equally benefit from income increases, or from crop productivity gains, without exploring differentiated ways that health, work burden, nutrition, or social status might be explicitly tied to changing crops, changing work requirements, or other dimensions associated with altered water resources. Intersectional analysis of these issues should be given attention in any study of water-related development transformations. In many instances, provision of irrigation or domestic water may prove beneficial for impoverished populations. Often, these benefits also proceed with associated losses, and variable benefits depending upon an individual's situation, wealth, ability to manage water resources, geographic location, or other factors. There are lessons that can be learned by reading across studies and sites, many of which demonstrate astounding parallels in terms of the ways that societies and ecologies adapt to changing water resources uses and conditions.

In terms of implications of this study for policy, there are several issues that deserve note. First, while GAP planners anticipated a number of costs and losses to proceed in parallel with any positive dimensions of these changes (e.g. rise in incidence of malaria, loss of grazing lands for animal husbandry, increasing work burden for women and children were all anticipated changes), more attention could be paid to alleviating the effects of some of these losses, through training, compensation of other mechanisms. The Turkish government has undertaken education campaigns and other health efforts to deal with malaria. Similarly, there could be targeted efforts to assist with needed livelihood transition away from animal husbandry or other ongoing changes. Second, there can be more efforts to involve women in farmer training and water management, and to recognize the important contributions women already make to agricultural livelihoods (see also Harris, 2005). As the government has established a series of women's centers throughout the region (see Harris and Atalan, 2002), these centers could be used to more actively link women's status and issues with the broader set of transformations underway in Turkey's southeast, including agricultural and similar changes (e.g. the centers might offer agricultural courses, in addition to sewing or embroidery as they currently do). The extension of the irrigation season to provide for

women's vegetable plots is yet another specific policy that could be explored to deal more adequately with gender differentiated experiences of irrigation.

In terms of some of the other contextual issues that are central for understanding the difficulties associated with the region, from landlessness, to ongoing conflicts related to the Kurdish issue, these also are policy considerations that have implications for the situation described in this paper (e.g. policy discussions related to land reform, or Kurdish cultural rights). With respect to these types of broader policy questions, there has been progress in recent years with EU accession negotiations and recent governmental shifts. The progress has been slow, however, and there have also been considerable setbacks, as with current flare up of conflict in the region (as in the news in fall of 2007, for instance). These broader policy considerations, as well as the broader context of the Iraq war, and the Middle East stability generally, are all paramount in conditioning the long-term effects of continued irrigation implementation and related investments within the GAP region.

Despite a number of difficulties associated with transition to irrigation in the Harran plain that have been described throughout this piece, a notable finding that deserves reiteration is that residents generally view irrigation, on the whole, very favorably. There continues to be a great deal of satisfaction, hopefulness, or anticipated benefits associated with access to freshwater resources in an area that is extremely dry, relatively impoverished, and has limited economic opportunities (see also Akşit, 1996 for discussion of the hopefulness related to GAP). To reiterate, in response to the question "In general, how would you characterize the changes irrigation has meant for your *village?*," 74% noted that irrigation has been positive, compared to closer to only ten percent who viewed irrigation as having negative effects (see Table 2 above to consider differentiated responses to this question). It is also noteworthy, that villagers tended to view themselves as having received slightly less benefit from irrigation than the village as a whole, as indicated by responses to a follow up question, "how would you characterize the changes irrigation has meant for *you?*" I interpret this slight skew between the two questions as the effect of a great deal of visible evidence of change, and wealth, in newly irrigated villages. Even if many poorer residents have not yet experienced wealth themselves, they are aware of the wealth that others have enjoyed with irrigation, and cotton production. They appear to remain hopeful that they too will enjoy similar benefits in the near future.

The government of Turkey intends to raise the status of residents in the Southeastern Anatolia region through irrigation delivery and other social development projects. Only efforts that ensure benefits of freshwater provision are equitable will lead to improved status and well-being over the long-term. As other theorists have suggested, equity with respect to resource use and access may also help to ensure that the resources themselves are democratically and sustainably managed. While there is not yet much evidence in the literature to support these types of claims, the possibility alone requires attention to these issues. Given that the Harran plain is a sort of 'pilot' irrigation area for the Southeastern Anatolia region as a whole, it is my hope that lessons learned from this pilot area also might be taken seriously to more effectively instill benefits of new water resource possibilities to all residents throughout the southeast region. This means not only extending benefits of Turkey's water resources to those residents of the

poorest region of the country, but also to ensure that benefits reach the poorest residents within the southeast region itself. It is these residents who are most in need of the delivery of services, improved health, and improved livelihood security that the GAP project seeks to provide. Whenever possible, efforts to guarantee these benefits are shared equally will be the best way to realize the hopefulness of these residents that they will no longer continue to be 'water rich and resource poor.'

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ENDNOTES

ⁱ For instance, the work of Carney (1993) indicates that irrigation adaptation in the Gambia led to a more intensive agricultural cycle, and increased land prices, which increased intra-household conflict related to control over women's labor. In a similar fashion, Schroeder's work (1999), also in the Gambia, demonstrates that changing environmental conditions led to struggles over access to land, often with men reasserting claims over lands that had been managed by women for small-scale vegetable production.

ⁱⁱ Studies by Zwartveen (1995), Pangare (1998), and Basnet (1992) all provide case study examples of the ways that women are marginalized with irrigation implementation, and further suggest that women's participation in irrigation management may contribute to success, efficacy, and sustainability of irrigation projects over the long term (see also Workshop on Gender and Water Resources Management, 1993; Zimbabwe Women's Resource Network, 1997; Upadhyay, 2003).

ⁱⁱⁱ For purposes of this discussion, my use of 'gender' remains limited to a discussion of the different situations of men and women in the case study context. For consideration of the ways that 'gender' as the social processes that maintain such distinctions might be related to changing water resource uses and management practices, see Harris, 2006. This other paper examines gender-water interconnections by considering changing associations of masculinity and femininity, especially as they take on new meaning in relation to the emerging irrigated economy, crops, and management practices in the case study context.

^{iv} GAP is the acronym for 'Southeastern Anatolia Project' in Turkish, Güneydoğu Anadolu Projesi.

^v Most evidence provided was collected during a seven-month field-work phase from May through November 2001. This included extensive interviews with GAP planners and residents of the Southeastern Anatolia region (2001, field notes), as well as a survey of 124 rural households implemented jointly with a professor and students from Harran University (Harris & Karahan Kara, 2001). The survey was carried out in 11 different villages of the plain, representing approximately 10% of Harran plain villages, and selected according to location in the plain (with villages selected to provide geographic coverage of all regions of the plain), as well as also representing five different irrigation union districts across the plain (sulama birliđi, literally 'irrigation unions', or 'water user groups'). For the in-depth interviews, there were approximately 30 male respondents and 30 female respondents. For the survey, 91 respondents were men, and 33 were women. Particular villages were selected based on size, from

300 to 800 residents (making these ‘middle’ sized villages), and primary language spoken (nine predominantly Arabic speaking villages and two predominantly Kurdish speaking villages were chosen to maintain the 80% Arabic speaking ratio of the plain).

^{vi} Income categories were self identified by respondents, noting respondents as either ‘well off’, ‘normal/moderate income’ or ‘poor’. See discussion under (i) ‘real income gains?’.

^{vii} There are also some differences suggested between Kurdish and Arabic speakers. While I do address questions of ethnicity later in the article, these data are a bit confounding vis-a-vis the general story I lay out based on historical and interview analysis of ethnic/linguistic differences.

^{viii} Many who considered themselves to be ‘normal’ might be considered to be ‘poor’ by other standards across Turkey, and globally, as many of these individuals may face considerable debt, or may be unable to access healthcare on a regular basis or send children to school (further, many of these residents live without running water or in-house toilets, for instance).

^{ix} Consistent with overall trends reported here, more men 76.9% reported income increases relative to 63.6% of women. Also, middle-income respondents reported income increases in higher percentages 76.5% than self reported ‘poor’ interviewees did, 66.7%. There was also a stark difference for land ownership, with 76.5% of owners reporting increases compared to 64.4% of landless residents.

^x Again, in terms of notable breakdowns related to this question, men observed greater increases in expenses than women (74% and 69% respectively), with quite a few more men than women noting that expenses ‘increased considerably’ (51% versus 36% for this category). Similarly, 83% of middle-income residents, and 56% of ‘poor’ residents identified increasing expenses. This number was high for landowners, 91%, compared with 59% for landless residents. For this last difference, I would expect increasing agricultural costs (mainly borne by the landowner accounts for part of this difference).

^{xi} Throughout the paper, names of the respondents have been altered.

^{xii} It is important to acknowledge, while in many contexts, access to water is mediated through landholdings, all farms in this context have access to irrigation water. Landless farmers would either have access to land and water through a renting, or 30% sharecropping arrangement. There are differences in terms of ability of landless to serve on water user groups due to minimum landholding requirements, detailed elsewhere (Harris, 2005).

^{xiii} This number, without access to lands, may include some survey respondents who are not farmers, such as teachers, *imams* or others who do not rely on farming income. The situation of unequal landholdings in the plain has existed for a long time, and is very complex. While I highlight some dimensions of this issue, it is beyond the scope of this analysis to address the history and changes associated with landlessness in any detail. Among notable dimensions of this issue, there was a failed national land reform effort in the 1970s, and very small ongoing efforts as part of the *Tarım Reformu* (Agricultural Reform) to distribute some state lands to farmers.

^{xiv} Here I say ‘family income’ purposefully as it is very rare for women and girls in the region to spend their own income. Instead, any earnings would typically go to the male head of household. At times, young girls are able to use small monies earned to buy household items for their *çeyiz* (trousseau for marriage), or gold for themselves.

^{xv} For landless families, there was about a 90% loss, comparable to the overall decline of approximately 88% for survey respondents as a whole. 80% of survey respondents said that the primary reasons for the loss of herds is related to lack of grazing lands, with many tying this directly to irrigation. This was a change anticipated by GAP planners.

^{xvi} While these indicators are generally consistent with my explanation, there were also several differences in responses to these questions that are more confounding for the analysis. Specifically, women were less negative than men about this loss (perhaps because of reduced work burden for women this loss represented?) Similarly, while I am not sure that this is significant, there also appeared to be slightly less negative association about this loss among Kurdish versus Arabic speakers (for instance 50% versus 72% among Kurdish and Arabic speaking women respectively).

^{xvii} In terms of breakdowns important for this discussion, 64% of women noted their workload has ‘increased considerably,’ while 49% of men provided the same answer (combining ‘increased considerably’ and ‘increased somewhat’ responses, 85% of men, and 75% women noted increasing work burden). It is also notable that more middle class interviewees noted their work had increased (92%) compared to 67% of ‘poor’ interviewees. I expect that some poor families are not able to find work, or have given up herding, so consider that they are not working as much. Similarly, 92% of landed residents, compared with 76% of landless note that their workload has increased, also posing interesting puzzles in terms of explanation for varied interpretations of these changes.

^{xviii} It is interesting to note that among Arabic speaking women, in particular, only 1/3 viewed this increasing work burden favorably. Among Kurdish speaking women, by contrast, ¾ viewed these changes as positive, relatively consistent with the 78% of Kurdish men who responded that this was a welcome change. While I do not want to reinforce stereotypes from the region, it is often cited that Kurdish populations are more open to change, and Arabic speakers more traditional (in terms of religion, livelihoods, etc..) so perhaps there are differences in terms of how these technological and societal shifts are viewed falling along linguistic, ethnic, or even religious lines.

^{xix} That article includes gender division of labor for instance (p 197). Among the notable features there, tasks that were identified as male labor by a majority of survey respondents include irrigation, hoeing, marketing crops, driving tractors, making important decisions, and driving cars. Tasks identified as feminine labor included care of children, cooking, and cleaning.

^{xx} First or second/third wives were grouped together in this marriage category. Among other differentiated responses of interest 18% of women indicated they would buy gold (representing savings for women); and more landless interviewees (42%) indicated they would buy land and houses over landowners (29%).

^{xxi} The loss of ability to process wool at home may also be related to increasing bride's price. A justification for bride's price is that the girls' family must provide needs to establish a new household, including a number of beds (for many children, and to receive visitors, both culturally valued in the region). In the past, women often made wool beds at home. Now with cotton production, demands on women's labor and declining animal herds have resulted in the need to purchase wool beds on the market. Thus, the expense of establishing the new home for the married couple is increasing, also perhaps driving up the expectation of what a man's family should pay as bride's price.

^{xxii} While family food intake was not an issue studied directly here, it is common practice in the region for adult men to eat first, followed by women and children, so these sorts of effects are possible, but not certain.

^{xxiii} Again, 64% of women indicating they are working 'considerably more' than before compared with 49% of men, although overall more men than women indicated that they are working more than previously.