WOMEN, PROCESSING INDUSTRIES AND THE ENVIRONMENT: A SOCIOLOGICAL ANALYSIS OF WOMEN FISH AND CRAB PROCESSING WORKERS' LOCAL ECOLOGICAL KNOWLEDGE

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WOMEN, PROCESSING INDUSTRIES AND THE ENVIRONMENT:

A sociological analysis of women fish and crab processing workers' local ecological knowledge

by

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ABSTRACT

Resource shortages and ecological degradation have drawn attention to management systems, and the scientific knowledge on which they are based, that have failed to provide sustainable ecosystems. In the case of Newfoundland, fisheries collapses have stimulated discussions on the value and potential of the ecological knowledge of local peoples in terms of successful resource management. Until recently, Newfoundland women have been left out of this literature on local ecological knowledge. In this thesis, I explore the local ecological knowledge of women fish and crab processing workers. I work through the standpoint of women, as processing workers, mothers, and wives, in search of clues to understanding what is necessary for sustainable fisheries and sustainable communities in rural Newfoundland. Because women's work and roles in their communities and families are different from men's, their knowledge about the fishery may be different from men's.

Fish and crab processing workers experienced tensions in their work as a consequence of such ecological changes as resource shortages and changes in the size and texture of fish in the 1970s, 1980s and early 1990s. Processing work is

mediated by technologies, ownership, and managerial strategies that are beyond the control of those employed at the plant, but help to shape workers' relationships with nature and limit sustainable practices. Women's labour process differs from men's because of the sexual division of labour in households and in fish processing plants. Their knowledge reflects their experiences in the processing plants, in the household and community. I argue that women acquire extensive knowledge about the fishery through their work, but also through their home and family lives. Working through the standpoint of women and their local ecological knowledge indicates that women are knowledgeable about fish quality, nutrition, capitalism and patriarchy in terms of resource declines. If these types of information have a gender-dimension, they would reflect the division of labour in the home and processing plants.

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CHAPTER ONE: INTRODUCTION

Women in Newfoundland fishing communities have been involved in the fishery for centuries. They have worked as processing workers, in inshore family-based operations during the era of the salt fisheries and, more recently, in modern processing plants. They have also worked as managers of fishing households, wives, mothers, and preparers of food. However, their fisheries related work, their relationships with the environment, and their knowledge about and derived from their experiences with the fishery were, until recently, ignored, devalued and misrepresented (Nadel-Klein and Davis, 1988; Neis, 1993; Porter, 1993).

This thesis is about knowledge. At present we are faced with a resource crisis. Many academics have questioned the present management regimes and the science upon which they are based. Some researchers are looking to local ways of understanding the environment in search of clues to sustainable practices (See Felt, 1993; Hutchings, Neis and Ripley, 1995; Neis, 1992; Neis and Felt, 1995; Neis, Felt, Haedrich, Hutchings and Schneider, 1995 for discussions on fishers' local knowledge and resource management). Even within this context, however, which provides space for marginalized voices, women's knowledges have not yet been documented. In this thesis I explore women fishery workers' ecological knowledge in search of clues to understanding what is

necessary for sustainable fisheries and sustainable communities in rural, outport Newfoundland. I draw on women's definitions of quality, changes in their work, and changes that they noticed in raw material as indicators of their ecological awareness. I will argue that women in fishing communities have been very much aware of ecological change but their awareness is somewhat different from men's. Women processing workers relate to fish not only as labour workers, but also as mothers, wives, and preparers of food.

In discussing sustainable resource management, we must consider not only direct human interaction with the environment, but also human interactions with one another. In this way we avoid placing ourselves outside the environment. Women's relationship to their environment and their knowledge about their environment are intimately connected to their productive and reproductive work (Shiva, 1989). Processing work is mediated by technologies, ownership, and management that are beyond the control of workers but help to define workers' relationships with nature and limit sustainable practices. Because of the sexual division of labour in fish processing plants and in households, women's labour process is different from men's. Immediate needs and household strategies are constraints that limit and shape women's ecological knowledge. Women's knowledge is mediated by these different

experiences and the ideologies and structural constraints that shape their lives (Omosa, 1992; Sunny, 1992).

A number of themes are reiterated throughout this thesis. Firstly, processing workers, who have been and are mostly women, transform raw materials into profitable commodities. Their knowledge about the fishery reflects a particular context, which is midway between harvesting and marketing. Interviews with these women indicate contradictions and tensions at the processing level, such as mismatches between raw material and marketability, between raw material and technology associated with resource decline from the 1970s to the early 1990s. Secondly, their perceptions of the fishery also reflect their embeddedness within their communities and families. This embeddedness causes them to experience tensions between raw material supply, the organisation of work, and the requirements of their home\community lives, i.e. the connection between nature, household and community. The marginalization of women and their knowledge has also meant the marginalization of indicators of ecological problems at the processing and home\community level. Sustainable resources are linked to sustainable communities. Sustainable practices must work in people's everyday lives.

This thesis is divided into three sections. In the first section I discuss the theoretical perspectives which have

informed my work, and I discuss my research methodology and its limitations. Secondly, I provide a historical look at Newfoundland's fishery, its management, and women's place within fishing communities. I also explore women's work in processing plants, which partly shapes women's relationships with their environment and their knowledge about that environment. Next, I provide a description and analysis of my research findings. I investigate women's local knowledge by exploring the ecological knowledge of women in the Bonavista region who were involved in the salt fishery, followed by those who work in modern fish processing plants, comparing inshore plant workers' knowledge with offshore plant workers' knowledge; I then look at crab plant workers' ecological knowledge. Next, I link women's roles as mothers, wives and preparers of food to processing work through a discussion of nutrition and fish in people's diets. Finally, I discuss some of the general themes relating to women's knowledge about the fisheries that have emerged from my research.

CHAPTER TWO: THEORETICAL PERSPECTIVES

2.1 Introduction

Fisheries collapses are one example of the global ecological degradation that is forcing us to question the effectiveness of accepted management regimes and the "scientific" knowledge on which they are based. The fishing industry has been an important source of food and income for Newfoundlanders. According to Hutchings and Myers, the Atlantic cod fishery "was once the largest and most productive cod fishery in the world" (1995:39). However, by 1992 the Northern cod faced commercial extinction. In an effort to rebuild the stocks, a cod moratorium was declared, displacing approximately 30000 fisheries workers. Newfoundlanders have experienced the grave repercussions of fisheries policies that have excluded input from fishers, processing workers, and other local peoples (Hutchings and Myers, 1995:39).

This thesis is about knowledge, the ecological knowledge of the women who processed fish during the salt fisheries and, more recently, in processing plants. This chapter is divided into two parts, one is theoretical, the other discusses methodology. In the first part of this chapter I explore some of the theoretical approaches that I have used to develop a

conceptual framework for interpreting women's knowledge and to explain the relevance of this research. I first discuss "normal science" and its critiques. Secondly, I examine the social constructivist perspective and feminist critiques of science and development. From there I go to the literature on traditional and local ecological knowledge (TEK\LEK). I conclude with the main elements of a conceptual framework for researching women's ecological knowledge and for interpreting that knowledge. In the second part of this chapter, I describe the methodology I used to research women's knowledge and the limitations and problems I encountered during the research.

My original intention was to look at particular ecological questions and issues related to the health of fish stocks and fishing communities from the standpoint of women in these communities.[1] Given their marginal status in both the literature on ecological knowledge, and on fishing communities in general, I hoped I might gain some further insight into the prerequisites for sustainable resources from this research. Some knowledge may be less distorted than other knowledge. Hence, it is necessary to gather the perspectives of as many groups as possible in order to develop a more holistic,

[1] I draw on Harding's (1991) Standpoint theory throughout this text and I will discuss it in detail later in this chapter.

overall understanding of our ecosystems, fisheries, and fishing communities.

Much of the present research on alternative knowledges focuses on indigenous, pre-industrial peoples and this is true of most of the literature that looks at women's knowledge systems. In addition, most of this literature deals with resource users as opposed to processors. This project is important because it begins the task of including women and processing workers in the general literature on ecological knowledge in Newfoundland. I argue that women processing workers' ecological knowledge is received, influenced and constructed differently from that of fishers and other groups in part because their paid and unpaid work experiences are different. In addition, this knowledge differs amongst these women according to job, age and marital status. The women I interviewed not only provided insights on the resource, they also identified important linkages between sustainable resources, sustainable households and sustainable communities.

2.2 "Normal science"

From the time of the Scientific Revolution (1500 - 1700) to the 1970s, "normal science", as a discipline and a way of knowing, has come to occupy a hegemonic position among systems

of thought in the western world (Merchant, 1980), partly because it claimed to discover "truth" (Kloppenburg, 1991). The normal view of science holds that science reliably represents the natural world independently of social context (Mulkay, 1979). Scientists were believed to be able to do this by using neutral tools and methodologies and detached observation. It was assumed that scientific research communities guaranteed the production of independent research, which was not influenced by social or political power relations, by virtue of their structure and methodologies. This structure supposedly discouraged bias and any interests other than the quest for "truth" from entering a scientist's work (Mulkay, 1979). These characteristics were believed to be fostered and protected in industrial, capitalist and democratic environments (Barnes, 1985).

2.3 Critique of "normal science"

Since the 1970s, researchers from various disciplines have challenged the validity of research practices and the production of scientific knowledge. Kuhn (1974) argues that established theories, methodologies and tools perpetuate scientific research practices. According to Kuhn (1974), particular theories, principles, and methodologies are adopted

because they are established models and, in this way, the production of scientific knowledge is the modification of knowledge that is already accepted by a scientific discipline. As well, the production of scientific knowledge is socially influenced by scientists' education. Students accept scientific practices and assumptions on the authority of these sources of information. They conduct research within the boundaries of existing research approaches.

Barnes (1985) argues that while "scientific" observation is an active process, it cannot be separated from social activity. According to Mulkay (1979), individual scientists evaluate and interpret observations in terms of their own research, theory, and methodology. In this way, new scientific knowledge is a reflection of applied theoretical approaches and methodologies more so than the natural world. In addition, "[s]cientific knowledge ... offers an account of the physical world which is mediated through available cultural resources; and these resources are in no way definitive" (Mulkay, 1980:60-1 in Finlayson, 1994:12). Cultural resources include symbolic resources, linguistic categories, and assumptions. "[T]he physical world could be analysed perfectly adequately by means of language and presuppositions quite different from those employed in the modern scientific community" (Mulkay, 1980:60-1 in Finlayson, 1994:13).

The scientific disciplines define what is and is not "scientific" based on the educational experiences of their members. They discredit knowledge produced outside their boundaries, restricting their data sources and maintaining their powerful positions as the sole generators of "truth" (Kuhn, 1974). The publication efforts of scientists, like all academics, are rewarded, usually in the form of financial grants. Academics' research papers are reviewed by colleagues as a form of quality control. However, the power and influence of an esteemed peer no doubt influences the assessments of his or her colleagues (Finlayson, 1994). The professionalization of science created jobs and social institutions for the preservation and transmission of its knowledge. The incorporation of scientists into our dominant social and political institutions has both strengthened the position of science and furnished various institutions and groups with varying degrees of influence over the direction of science (Barnes, 1985).

2.4 The Social Constructivist View

Research in the area of the sociology of knowledge examines how specialised knowledge systems are socially, culturally, historically and contextually produced (Finlayson,

1994; Mulkay, 1979). Within the sociology of scientific knowledge, the social constructivist perspective suggests that science, like any other form of knowledge production, is socially produced (Mulkay, 1979). This approach maintains that science is a construction rather than a direct representation of reality because human activity is inevitably socially presupposed. Human activities reproduce and alter established knowledge, institutions and culture. Thus, scientific interpretations are produced using pre-existing "scientific" criteria (Barnes, 1985).

The scientific study of nature does not necessarily result in unique explanations of data, but rather there exists "interpretive flexibility," meaning there exists a range of possible interpretations for the same data (Finlayson, 1994). Therefore, accepted explanations of data are constructed negotiations rather than "truth." The constructivist perspective holds that the breadth of possible interpretations of data is shaped by the context (Finlayson, 1994). As resources, methodologies and tools of scientists change, so too do their interpretations (Mulkay, 1979).

Cultural and social institutions and powerful interest groups can influence the direction of scientific knowledge and encourage its acceptance (Barnes, 1985; Mulkay, 1979). The private sector in particular directs science towards specific

problems and technological solutions (Kloppenburg, 1991). In addition, access to expert knowledge equips governments with the power to form policies and to legitimate decisions. Scientists are often employed by the state, or depend on the state for financial resources. This situation may intensify the demand to sacrifice independent thought for politically motivated interpretations (Barnes, 1985; Finlayson, 1994).

2.5 Discussion of Traditional and Local Ecological Knowledge

Some critiques of "normal science" argue that because science embraces reductionistic and positivistic approaches, a holistic understanding of the world is impossible. Instead, "normal science" perpetuates "a hierarchical and linear rather than an interactive and ecological view of nature" (Kloppenburg, 1991:530). These critiques have opened up discussions concerning local and traditional knowledge and the potential importance of this knowledge for successful resource management.

In "modern" times, the local knowledge of groups like fishery workers has been "hidden from history" (Kloppenburg, 1991:538). Scientists often deny the effectiveness of local approaches to understanding our world because they are restricted to local experiences and applications and cannot be

applied generally. Science acquires power because of the universalism of its laws. Its application across localities often marginalizes both local knowledges and local ecological rhythms (Murdoch and Clark, 1994). However, because science has failed to provide us with sustainable resource management, some argue we must look to other knowledge systems, including those which are locally produced, to provide alternative interpretations of nature and our place in it (Kloppenburg, 1991).

Since the mid-1980s, there has been a growing body of literature on Traditional Ecological Knowledge (TEK) (Berkes, 1987; Felt, 1993; Freeman, 1992; Gadgil, Berkes and Folke, 1993; Kloppenburg, 1991; Neis, 1992). Traditional Ecological Knowledge has been defined by Madhav Gadgil, Fikret Berkes and Carl Folke as a "cumulative body of knowledge beliefs handed down through generations by cultural transmission about the relationship of living beings (**including humans**) with one another and their environment" (1993:151, emphasis my own). Another definition describes TEK as the "sum of the data and ideas acquired by a human group on its environment as a result of the group's use and occupation of a region over many generations" (Mailhot, 1993:11). However, there is no universally accepted definition of TEK in the literature.

According to Neis and Felt (1995), TEK attempts to link ethnoscience and cultural ecology. They describe ethnoscience as the "description of cultures 'from the inside'," and the construction of ethnotaxonomies in order to classify knowledge. Cultural ecology, on the other hand, is "premised on the assumption that modes of production are essentially adaptations to the physical environment" (1995:4).

According to Neis and Felt (1995), TEK literature has dealt mostly with indigenous peoples in societies where people have an historical association with a particular area, little class differentiation, limited technologies and limited western industrial contact. TEK literature suggests that local and traditional ways of knowing the world are based on experience, are orally transmitted over generations, are intuitive, qualitative, and holistic. In addition, like science, TEK changes in response to social, economic, political and technological factors (Neis and Felt, 1995). Local peoples often have their own vocabularies and systems of classification to describe their environments. They often experiment with practices and tools in their day to day interaction with nature (Kloppenburg, 1991). Fishers, farmers and other resource users possess considerable information about the local environments within which they work and live (Kloppenburg, 1991; Neis, 1992). This knowledge is different

from scientific knowledge because it is local in nature (Murdoch and Clark, 1994). TEK authors argue that it is a valuable source of knowledge which should be used as a supplement or alternative to "normal science." Most of these authors argue for the inclusion of traditional ecological knowledge in resource management decisions (See Felt, 1993; Felt, Neis and McCay, forthcoming; Hutchings, Neis and Ripley, 1995; Neis and Felt, 1995 for discussions about the value of local knowledge).

Newfoundland fishery workers work in a commercial industry and "differ from indigenous peoples in that they have been more affected by western scientific and management techniques" (Neis and Felt, 1995:4). For Newfoundlanders, "the transmission of traditional knowledge between generations is often mediated by formal education, periods of outmigration and technological and industrial change" (Neis and Felt, 1995:4). Thus, the term Local Ecological Knowledge (LEK) seems more appropriate than TEK to describe their knowledge. Kloppenburg describes "local knowledge" in the following way:

> It is the **locality** of such knowledge production which most completely intimates the many dimensions of its character. Such knowledge is **local** in the sense that it is derived from the direct experience of a labour process which is itself shaped and delimited by the distinctive characteristics of a particular place with a unique social and physical environment (1991:528, emphasis in original).

This knowledge is practical and is acquired through direct experience from day to day. All groups of people, including scientists, learn through praxis and use it to manage their lives (Palsson, 1995). Normal science and LEK\TEK differ in "the organisation of the observations and the physical recording of them which for the scientists usually has to be sufficiently detailed to be repeatable or comparable" (Gunn et al., 1988:25, in Neis and Felt, 1995:4-5). They do not necessarily differ in the type of observation. LEK has been marginalized by scientists who maintain that local knowledge is anecdotal and unreliable (Finlayson, 1994:180). Accepting LEK as a legitimate way of knowing would also mean a lessening of the unique prestige of the scientific disciplines (Kloppenburg, 1991). In making the argument for the inclusion and legitimisation of local knowledges, Murdoch and Clark (1994) argue that authors risk romanticising local knowledge as a superior and more holistic way of understanding the environment than science. They argue that local knowledge is not inherently preservationist. Rather, local knowledge may sometimes hinder sustainability and even contribute to ecological crisis (Murdoch and Clark, 1994).

2.6 Ecology and sustainability

Successful sustainable development must consider the social and the natural worlds and the interaction between both worlds.

> [S]cientific solutions which focus solely upon the "natural" world and social scientific solutions which focus solely upon the "social" world will both fall short of requirements ... [T]he difference between Western scientific knowledge and the (local) knowledge of other cultures lies not in the supposed "universality" of the former but rather in the way that it allows the construction of networks, composed of certain types of humans and non-humans, which carry scientific facts and laws across ever greater distances (Murdoch and Clark, 1994:130).

Redclift (1992) considers sustainable development using three dimensions. Firstly, the economic dimension questions placing nature outside of economics and encourages protecting the environment from population demands. Secondly, there is a political dimension. Management and development schemes reflect the ways groups of people try to control each other and nature. The type of knowledge chosen to be the foundation and justification for development projects is linked to power. The last dimension of sustainability is the epistemological. In this way scientific knowledge and traditional knowledge are identified as ways of knowing that have varying degrees of

power and legitimacy (Redclift, 1992, in Murdoch and Clark, 1994:116).

The definition of ecology should not place the social world outside of the natural world. It entails human interaction with the environment but also human interactions with each other. Social barriers between local peoples and scientists or policy makers have prevented ecologically sound decisions and practices and these have to be addressed in conjunction with questions about sustainability and ecology (Murdoch and Clark, 1994; Shiva, 1989).

2.7 Feminist Perspectives

Feminist authors are committed to legitimising women's voices. In recent years, feminist authors have developed critiques of science and development. Connelly, Murray Li, MacDonald and Parpart (1995), Pevato (1994), Shiva (1989), and Paul (1989) argue for the integration of gender into environmental issues. Eichler (1987), Harding (1991), Merchant (1980), and Messing (1987a) argue that science as presently constructed is gendered. Below I develop further the theoretical framework I use to analyse fishery workers' local ecological knowledge and provide theoretical justification for the inclusion of women in research of this kind. I begin by

exploring eco-feminism as outlined by Shiva (1989) and Merchant (1980), followed by critiques of this perspective. Next, I discuss Harding's (1991) standpoint theory. Finally, I discuss how this theoretical web is used to analyse women's local ecological knowledge.

2.8 Women and nature

2.8.1 Eco-feminist theory

Eco-feminist approaches suggest that modern science empowers and legitimises industrialism, capitalism, masculine ideology, and development schemes. These approaches blame development projects based on "progressive" and "modern" science for both ecological degradation and the marginalization of women's productive and reproductive roles (Merchant, 1980; Shiva, 1989). According to Shiva (1989), scientific solutions and technological applications have often meant great losses and sacrifices on the part of "other" races, classes and the "Other" gender as well as nature. Reductionist and fragmented approaches embraced by "normal science" devalue the productivity of the "Other" (Merchant, 1980; Shiva, 1989).

During the Scientific Revolution between 1500 and 1700, western, modern, dominant and "progressive" ideology emerged.

According to Merchant (1980), during this time the metaphor used to describe the natural world, including humans, shifted from that of an organism to a machine. In Europe this was encouraged by laws, technologies, and political and social institutions which expunged all animistic assumptions about nature to create a predictable environment, legitimising the manipulation and "rape" of nature. In addition, people's day to day relationship with nature changed with new technologies and resource depletion (Merchant, 1980).

Shiva (1989) argues that western science and commercial interest detach a resource from the rest of nature, ignoring the multi-purpose utilisation inherent in resources while capitalising on mono-cultures and single resources. Shiva argues that these approaches are political and based on power. This approach has led to ecological and economic vulnerabilities due to lack of diversity and resource-wasteful methodologies and technologies. Shiva argues that western science, based on reductionism, is "violent" in that it defines one way of knowing. She emphasises the "life-destroying" view of nature associated with western science:

> The dualism between man and nature has allowed the subjugation of the latter by man and given rise to a new world-view in which nature is (a) inert and passive; (b) uniform and mechanistic; (c) separable and fragmented within itself; (d) separate from man; and (e) inferior, to be dominated and exploited by man (Shiva, 1989:40-1).

From Shiva's (1989) perspective, ecological degradation and the marginalization of local knowledges results in violence against women, nature, communities and knowledge. It converts women into non-knowers and nature into an object to be manipulated. It robs people and communities of their productive ability and sustenance. It makes productive and reproductive work increasingly difficult, damaging the health of women workers and increasing the likelihood of food shortages and hunger. In addition, it silences and distorts the "truth."

According to Shiva (1989), productivity should be defined in terms of producing life and sustenance. This kind of productivity has been ignored by western, scientific approaches despite its survival value. She advocates defining "productivity," "yield" and "economic value" in terms of survival value and communal and diverse use of resources. Future definitions of economics and ecology must incorporate the production of sustenance and needs fulfilment.

According to Shiva (1989), women and nature have been historically linked across cultures. In the twentieth century, the women's and ecological movements have developed similar critiques of science, capitalism, "progressive" ideology and domination. Recently, the ecology movement has reconstructed

the image of an organic earth which sees the world as an unpredictable, interconnected, non-linear living unit (Merchant, 1980). This image was largely accepted by the Western world before the 1500s. The Romantics, in the early nineteenth century, also embraced this image in reaction to the Scientific Revolution and its mechanism. The image of a living cosmos rejects the machine metaphor used to justify the manipulation of nature. In this way, the recent ecology movement constructs alternative, but not necessarily new, philosophies to understand nature (Merchant, 1980; Shiva, 1989). Shiva (1989) argues that as long as the ecological and women's movements remain separated, we have little hope of rescuing nature and overcoming the barriers to sustainability. Women's struggles against subordination and marginalization must be integrated into discussions concerning the destruction of Mother earth to prevent the natural world from being separated from the social world when discussing ecology.

Shiva argues that sustainability will be achieved by embracing the feminine principle, as practised by Indian women, which is

> characterised by (a) creativity, activity, and productivity; (b) diversity in form and aspect; (c) connectedness and inter-relationship of all beings, including man; (d) continuity between the human and natural; and (e) sanctity of life in nature (1989:40).

2.8.2 Critiques of eco-feminism

The eco-feminist perspective has been criticised for assuming that all women have a more intimate relationship with the environment and are thus more conservationist than men. However, women do not always have a more intimate and holistic understanding of nature. Research on African women (Haile, 1989; Mackenzie, 1993; Omosa, 1992; Rathgeber, 1995; Sunny, 1992) demonstrates that women may knowingly hinder sustainability through their daily activities. In order to understand women's decisions, their relationship with and knowledge about and from the environment, we need to take into account the sexual division of labour, the capitalist division of labour, household economic constraints and other immediate interests and needs that are linked to their productive and reproductive roles, including responsibilities to the household, family, and communities.

Work on women and the environment in Africa highlights the connection between women's ecological knowledge, their direct and daily engagement with natural resources, and their productive and reproductive labour (Rathgeber, 1995). Women's knowledge is gained through their domestic and caring duties, their engagement in community work, and experiences in paid

work which together create a special knowledge which may help in terms of sustainability. Because this work is different from the work men do, their ecological knowledge and relationship with nature is different from men's. Like everyone, women have a long-term vested interest in the preservation of nature. Their incomes and the health and nutrition of their families depend on resources. However, short-term and immediate interests and needs of the family may pressure them to compromise this (Rathgeber, 1995).

According to Haile (1989), women's relationships with the environment are mediated by means of support. Haile suggests that when no other means of employment is available, women, like men, may willingly participate in environmentally unsustainable practices even though they are aware that resource depletion threatens their survival and income. Sunny (1992) argues that rural people rarely consider resource depletion independently from household economics. Women who are aware that their work is furthering resource depletion may be acting out of necessity. This behaviour may be a "rational" attempt to overcome immediate economic constraints. During ecological and economic crises, the responsibilities and unpaid work of women are intensified (Mackenzie, 1993; Omosa, 1992).

2.9 Standpoint theory

Critiques of Eco-feminist approaches argue that researchers must avoid assuming that women, by virtue of their sex, have an intimate relationship with nature. However, this literature also points out that women and men do have different relationships with nature because of the different work they do and the sexual division of labour at work and in the household. Harding (1991) suggests that starting from the perspectives of marginalized groups, like women, provides a more reliable understanding of reality than working from conventional approaches.

Harding (1991) argues that the production of scientific "facts" is directed by social groups. Scientific knowledge is socially constructed, gendered, and embraces a western, patriarchal, imperialistic ideology (Harding, 1991). There is no true objectivity as "normal science" assumes. Even further, theories about nature sometimes reflect interpretations about society and may imply how people should behave. Harding argues that a stronger science takes into account the social production of societies' beliefs and knowledge.

> ... [T]he sciences need to legitimate within scientific research, as part of practising science, critical examination of historical values and interests that may be so shared within the scientific community, so invested in by the very

> constitution of this or that field of study, that they will not show up as a cultural bias between experimenters or between research communities (Harding, 1991:146-7).

Harding argues that working through the standpoint of the "Other" can reveal hidden socio-cultural biases embraced by dominant knowledges and beliefs and create a less distorted understanding of our world. Feminist standpoint theory draws on women's knowledge that has been shaped by their distinctive experiences in a gendered society in order to understand our world. Experience alone, however, is not enough to ensure the production of reliable knowledge. Women do not hold a more objective view of the world by virtue of their biological sex, but rather by virtue of their struggles to overcome oppression (Harding, 1991).

> Insofar as women and men are assigned different kinds of activities, they lead lives that have significantly different contours and patterns. Starting thought from the historical details of women's lives in order to evaluate critically the dominant knowledge claims that have been generated primarily from the lives of men ... can decrease the partialities and distortions in the pictures of nature and social life that are provided by the natural and social sciences (Harding, 1991:141 in Langlois, 1996).

Harding (1991) states that local and distinctive experiences, especially disregarded and depreciated ones, are valuable resources for research. However, experiences in

themselves do not directly reflect realities. Women are heterogeneous in terms of class, race, sexuality and culture and their experiences and knowledges are often contradictory, making it difficult to make generalisations. Eichler (1987) argues that because we live in a gendered society, a women-centred approach to research is necessary in order to produce reliable knowledge. At the same time though, researchers must take into account that women do not live independently from men. Non-sexist research constructs the world around both men and women and, for Eichler, is the ultimate aspiration of research. A non-sexist world would end the need for feminist research. Work on women and nature suggests that we need to look for definitions of ecology and sustainability that include not only nature, but also the social world, because each responds to changes in the other.

2.10 Women's local knowledge

Feminist theory argues that women's knowledge is acquired through their distinctive praxis and experiences. More specifically women's knowledge is gained through day to day interaction with their social and natural environment. Women acquire knowledge about their environment through experience and oral history, and in formal and informal,

academic and local settings. A process-oriented perspective appreciates that "actors act in different roles depending on their definition of the situation" (Gerrard, 1995:594). In this way, how a person understands the world is defined in part by the limitations and possibilities by which she defines herself. Some feminist literature suggests that women's knowledge is more integrated than men's about some things and less integrated about others because of their distinctive roles and experiences. It points to the mismatches between dominant knowledges and women's knowledge, revealing the link between knowledge and power (Gerrard, 1995; Rathgeber, 1995).

The literature on women and nature suggests that women actively learn from their roles as mothers, wives, paid and unpaid workers (Ling, 1989; Rathgeber, 1995). Women's local ecological knowledge is partly shaped by individual differences in the circumstances of each woman and is embedded in their understandings of science, day to day decision making knowledge, domestic duties, paid and unpaid work, the sexual division of labour, and relationship with a resource that changes over time (Gerrard, 1995). In considering women's knowledge we must be aware of the particularities of their work experience, as paid and unpaid workers, since work and work environments partly help to shape their knowledge. Women's paid and unpaid work is different from men's and is

mediated by dominant ideologies (Armstrong and Armstrong, 1990). Women are disproportionately concentrated in poorly paid and dead-end jobs. Women have been excluded and discouraged from entering traditionally "male" jobs, which are usually more prestigious, higher paid and entail higher levels of control. Dominant ideologies attempt to justify sex segregation in the workplace emphasising biological differences between the sexes (Duffy and Pupo, 1992; Messing, 1987b). Women's knowledge is different from that of men and takes into account different things. It can provide the "other" side of the story (Harding, 1991).

Authors who have studied women's knowledges (Gerrard, 1995; Harding, 1991; Rathgeber, 1995; Shiva, 1989) argue that they are often different from dominant, capitalist, scientific, bureaucratic, developmental knowledges. The scientific community sees the environment as its realm of expertise, discouraging input from locals (Rathgeber, 1995). Literature on women in India (Shiva, 1989), Africa (Haile, 1989; Mackenzie, 1993; Omosa, 1992; Sunny, 1992), and women plant workers in fishing communities in Norway (Gerrard, 1995), suggests that women's knowledge is integrated and holistic about certain issues but less so about others because of the work they do and the roles they fill. Because women processing workers are expected to meet particular performance

standards, they acquire knowledge about the raw material with which they work. Keeping their jobs depends on using this knowledge. In order to meet managerial requirements, these women must know details about the quality of the fish, the effects of machinery on fish and work, and how to successfully negotiate an incentive system and changes in the raw material. Likewise, women draw on their constructed definitions of quality when preparing meals for their families. Mothers have ideas about the nutritional value of fish and fish parts. When I asked women about their ecological knowledge, women I spoke with simply answered my questions by drawing on their work experiences at home and at work. The division of knowledge among groups, such as men and women, fishers and scientists, reflects the division of labour and the division of power. Policies that are based on dominant knowledge affect the men and women in fishery households differently. Government policies have been gendered and these policies may affect women's perceptions of what is happening ecologically (Wright, 1994; Neis, 1993).

2.11 Strengths of women processing workers' ecological knowledge

I have chosen to deal specifically with women for a number of reasons. I conducted my research while working within a larger group, the Eco-Research Program. A sub-section of this group researched fishers' ecological knowledge and we recognised a gap in the research, in that plant workers and women's insights were not being used as sources of information. This thesis should be seen as a point of departure for an investigation of the ecological knowledge of women in Newfoundland fishing communities. By focusing on women I recognise that women's and men's relationships with nature are different and are mediated by policies (Connelly and MacDonald, 1991-2) and work experiences (Armstrong and Armstrong, 1990, 1984) that affect men and women differently and thus produce somewhat different understandings of their environment. Women processing workers with whom I spoke recognised that their paid work in the plant was not given the same attention by the media and the government as that of fishers' and thus their work was somehow devalued. One woman fish plant worker said:

> ... plant workers should be treated like fishermen as far as I'm concerned, I mean what would the fishermen do with their fish if the fish plant workers weren't working, you know.

Below I look at the strengths of women processing workers' ecological knowledge.

The social constructivist perspective and feminist critiques of science provide theoretical justification for the inclusion of women in the literature on ecological knowledge. In my own work, that means exploring the ecological knowledge of women in fishing communities who processed fish as part of family-based operations, "making fish" during the salt fishery, and the knowledge of women who work in modern fish plants.

Fisheries science and management have been largely the preserve of men. Women fishery workers have had relatively little access to formal scientific understandings about fisheries resources. Their knowledge about fisheries is largely a product of their work experience, as well as their changing roles in the household, at work, in the community and with government. As a form of "vernacular" knowledge, like the women workers themselves, it has been marginalized within industrial fisheries (Franklin, 1990). Working through the position of these women is important for a clearer understanding of Newfoundland's people and their environment. By doing "gender neutral" analysis of the environment, we fail to gain an accurate picture of human interaction with the environment (Rathgeber, 1995). By denying women's roles as

processors of raw material and managers of fishery dependent households, we mask the responsibilities and constraints faced by rural women. Standpoint theory is useful in interpreting women's position as "outsiders" and how this position can be useful in understanding women's knowledge and how they articulate it, as well as understanding how social and oppressive institutions and ideologies work in their lives (Harding, 1991).

Secondly, research on women's knowledge has shown that women's knowledge is acquired through praxis and through their day to day experience and interaction with others and nature at home and in their communities (Gerrard, 1995; Rathgeber, 1995). The division of labour in the household often means that women are primarily responsible for bookkeeping in fishery-dependent homes. Women tend to know more about the financial aspects of their households. Without understanding this division of labour, researchers may not know who holds particular information and thus, may not get the full picture (Neis, personal communication).

Thirdly, women plant workers' positions in the plant and in the home allow us to see the world not just in terms of the natural barriers to sustainability, but also to identify social and economic barriers to sustainability. In a discussion on sustainable resource management, we must

consider not only humans' interactions with the environment but also humans' interactions with one another (Gadgil, Berkes and Folke, 1993). Fish processing workers transform the products of fishing, mediated by relationships of ownership, technologies and government management over which they have little control (Fishery Research Group, 1986; Rowe, 1991). They must meet the requirements of the market place in a work environment where they have varying degrees of control over the organisation and content of production (Neis and Williams, 1993) and where their perceptions of what is happening and why might be quite different from those of management (Fishery Research Group, 1986; Neis and Williams, 1993; Rowe, 1991).

People's work experience and day to day experience of and ways of knowing nature are constantly changing because of technological innovation and resource depletion (Merchant, 1980). Changes in women's work environment often indicate economic and ecological changes. In addition, the definition of ecology can be extended to include the work environment. In this way, occupational health issues can be linked to ecological knowledge. Treating people like machines, damaging them physically, and the effect this has on processing fish resources are all part of the ecological experience of processing workers (Neis and Williams, 1993). Resource degradation, nutrition and hunger are ecological issues.

Finally, theoretical literature on women and nature demonstrates that sustainable fisheries have to work in people's lives (Murdoch and Clark, 1994). There are many things on the social\human side, such as patriarchy and capitalism, that oppress women and limit sustainability, both in the household and in the larger scheme of things. These social, economic and political barriers must be addressed before we achieve sustainable ecosystems. Ecological knowledge is shaped by interaction with both the natural and the social, just as ecology includes both human and non-human realms (Murdoch and Clark, 1994; Shiva, 1989).

In the 1970s, overfishing, resource shortages and changing markets intensified the contradiction between nature and the fishing industry. Companies responded to this contradiction by making a wider variety of products, and with new technologies and management strategies (Neis, 1991, 1988). Aquaculture is a recent capitalistic response to resource decline. Looking at the market place, one would never say there was a shortage of fish. Because women work in the plants, and prepare and eat fish, they can tell us something about what is happening, how capitalism is responding to resource shortages and decline, and whether or not those changes are sustainable. The marginalization of women and their knowledge has limited researchers' understandings about

knowledge and about how capitalism and patriarchy respond to resource shortages. This has limited the extent to which we can fully understand resource decline, sustainability and nature.

2.12 Description and Explanation of Method

I have chosen to conduct research with women in discussing local ways of knowing the environment because their voices have been largely neglected. They represent a large section of the processing sector and they are directly affected by resource decline. I interviewed three men, but for a number of reasons, I did not interview others who worked in the processing sector. Firstly, time constraints meant I had to prioritise. Secondly, I wanted to send the message throughout the local communities that my main objective was to talk with women and to give priority to their knowledge. Given women's uncertainty about the adequacy of their knowledge in comparison to that of their husbands, I decided that this would be the best approach. Women had a difficult time communicating their ecological knowledge. This is understandable considering their marginal status in fishing communities (Sinclair and Felt, 1992). Theoretically, a women-centred approach to research recognises that policies affect

women and men differently and that women's work processes and general experiences are different from those of men (Armstrong and Armstrong, 1990).

I used a qualitative, open-ended interview approach to my research because I felt that I could achieve a more relaxed atmosphere with open-ended questions, where the respondents could lead the interview and do most of the talking. I also thought this would be less intimidating. Open-ended questions rely on people's words and recollections, and their active involvement in the transmission of their knowledge (Ferguson, 1996; Judd, Smith and Kidder, 1991). I use excerpts from interview transcripts throughout this thesis, some of which have been edited for style, meaning I have omitted pauses, some repetition and sighs which are found in conversational speech. I have not attached names nor descriptions of the people to the transcript excerpts because I did not want to compromise anonymity. In addition, because this is the first attempt at gathering women's local ecological knowledge in Newfoundland fishing communities, the entire interview process was a learning experience. This method made it easy to make such alterations to my interview schedule as including issues which were brought to my attention by the respondents but which I had failed to incorporate. One example of this is the addition of questions concerning retraining and other

educational programs offered to fisheries workers since the moratorium.

This work is part of a larger interdisciplinary and interinstitutional project, the Eco-Research Program, that has focused its research in a particular region of Newfoundland. Its goal is to research ecosystem sustainability, including both the natural and social realms, over time in order to identify the prerequisites for sustainable communities and resource management. My work falls within a sub-section of this larger project that looks at the local ecological knowledge of fishery workers. My own research entailed interviews with processing workers from the communities of Bonavista, Catalina, Spillar's Cove, Melrose, Elliston, Port Union and Little Catalina. I began interviewing people in this area during the summer of 1995. I arrived in the area at the end of June and stayed until late July living with a team of researchers in one of the communities. During this time I gathered a list of names of plant workers by asking local people and researchers who had previously done work in the area. I telephoned some of the women whose names were on my list to set up interviews. Most of the women I contacted were more than happy to give freely of their time and knowledge, and often referred me to other women they thought I should interview. In this way I developed a snowball sample of

informants. I thought that this approach would be best because this work is largely exploratory. Besides the problem of not having a random sample, my method could have created another problem. The information retrieved from people willing to speak to me could have been quite different from those who refused to be interviewed. Luckily, only one person refused.

I formally interviewed 26 plant workers in total, 3 of whom were men. Of the 26 respondents, 3 women had also been involved in "making fish" during the salt fishery. Of the 23 women interviewed, 19 worked in fish plants, 6 in the Bonavista inshore fish plant and 15 in the Catalina offshore fish plant. In addition, of the 23 women with whom I spoke, 11 had spent at least some time at the Bonavista crab plant. At least 4 of these 11 women had spent most or all of their working career at the crab plant in Bonavista.

Nearly all of the respondents grew up within fishery dependent households, meaning that either their fathers fished or worked in the fish plant for a living, their mothers worked in the fish plant or made fish, or both. Even when a respondent's family of origin was not directly dependent on the fishery, the fishery was recognised as an important part of the community's economic base. The respondents ranged from age 30 to 88 years old, most of them were in their 30s and 40s. This is important because most of the women who work in

fish plants tend to be within this age range (Rowe, 1991). Some had no children, others had 12 and 13, and the average number of children per respondent was 2. The marital status of the respondents varied: two were single, twenty-one married, one separated, and two widowed. Most of those women who worked in the inshore Bonavista plant were married to inshore fishers, while the majority of the married women who worked at the Catalina plant were married to plant workers.

The women with whom I spoke who worked at the Bonavista fish plant worked mostly at packing the fish for sale. However, these women suggested that they did a variety of other jobs over the years and throughout the working day if necessary. The women with whom I spoke who worked at the Bonavista crab plant did a variety of jobs: removing the meat from the crab, tending roller machines, picking shells from the meat under blacklight, cleaning crab, packing crab, and service work. These women also suggested that they did a variety of jobs throughout their careers at the plant and during the average day. Women with whom I spoke who worked at the Catalina offshore plant worked at various jobs including: boning, packing, quality control, service work, janitorial

work, weighing fish, grading, trimming, and machine tending. One woman acted as a temporary supervisor when needed.[2]

2.13 Limitations\Problems of Method

People with whom I spoke were both kind and generous with their time, knowledge and food. I think that this generous response was partly due to the fact that I was a student and was also a "native" Newfoundlander from Trinity Bay; perhaps people felt I was an "insider" (Ferguson, 1996; Harding, 1991). In addition, I think that because I was younger than the people I spoke with, perhaps I was not intimidating. However, the fact that I come from rural Newfoundland also created some problems. Coming from rural Newfoundland, I am equipped with my own biases and assumptions about "our" way of life. For example, my own experience of life in a small, outport community was shaped and restricted by patriarchal assumptions. I assumed that other women would readily express this sentiment of "oppression." However, this was not always the case. I sometimes struggle with interpretations and the issues involved in representing Newfoundlanders and their communities both positively and

[2]A more detailed description of processing jobs is found later in this text.

negatively to readers. In fact, feminist literature on fishing communities and some of the women I spoke with, pointed to women's independence and mostly positive experience in outport Newfoundland (Porter, 1993). This is not my experience of rural Newfoundland.

The interview method also posed some problems. Despite my "insider" status, I had not worked in or visited a fish or crab plant and I had to rely on the transcripts of the interviews and secondary literature to acquire an understanding of the work. These problems, combined with my short period of field work, may mean there are such potential shortcomings with the thesis as misinterpretations and misunderstandings on my part. Maybe because I was identified as another rural Newfoundlander, some of the people I spoke with assumed I knew more than I actually did. Despite this problem, the women and men I spoke with described their work and work place.

In comparison to the men with whom I spoke, the women were more difficult to interview. The women were generally shy and unsure that they could offer appropriate or accurate information. Some women said that their husbands could probably provide more accurate information. These types of responses were especially apparent among older women. However, all of the women were very receptive to me and I

think they were happy to be given an opportunity to have their opinions heard. When I interviewed women with their husbands near, the husband would usually "correct" their responses and add to the information that the women gave. One husband even stated that I should interview him because his wife did not know how the plant operated. Because the questions were open-ended, I encouraged women to lead the interview as much as possible without getting too far away from the task at hand. They usually provided the information I was looking for even when I did not ask specific questions.

I believe that many women found the tape recorder intimidating and intrusive (Judd, Smith and Kidder, 1991). In fact two women refused to be taped. They may have questioned my motives for asking questions about their work. A couple of women asked if I was working with the government or the media and may have feared losing TAGS[3] benefits if they presented themselves or their family or friends in a negative light. Others voiced concerns about being portrayed negatively, i.e. as uneducated and lazy.

Women often used hand gestures. Body language and facial expressions are not captured on tape (Judd, Smith and Kidder,

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[3]Since the declaration of the cod moratorium in 1992, the state has introduced financial packages as part of the fisheries adjustment process. The first was NCARP (Northern Cod Adjustment and Recovery Program). This was later replaced by TAGS (The Atlantic Groundfish Strategy).

1991). When I first started interviewing I also took notes on these and other impressions during the interview but I found that this made women feel somewhat uncomfortable. Eventually, through trial and error, I stopped taking notes during the interviews and started to wait until after the interview to record any additional impressions that I might have. No doubt I lost some information by doing this, but I think I gained the trust of the respondents more easily. I could devote more energy to showing my interest in what they were saying instead of anxiously writing notes. As well, during some interviews women were busy cooking meals and tending to children. This sometimes distracted them and myself from the issues at hand.

I think it is important to recognise that in speaking to mostly women and given the sexual division of labour in processing plants, I am covering only a limited number of jobs at the plant and thus may be offering limited information and knowledge about resource and work changes. In addition, I have covered only part of the variety of jobs that women do at the plant. These problems were partly due to my short period of fieldwork.

An interview schedule, no matter how flexible, carries assumptions (Judd, Smith and Kidder, 1991). My own interview schedule changed over time. I added issues that were raised by people and were of obvious relevance to their lives and how

they saw their world. Women I interviewed eagerly spoke about retraining options, the problems with the existing design of educational programs, and the limitations that face women in terms of retraining. These issues eventually became a part of my research. I tried, however, to maintain the original structure of the interview schedule for comparison purposes.

The Bonavista region has been the focus of much academic research in recent years and sometimes I got the impression that people were tired of answering questions, sometimes personal ones, especially when they saw no positive results in terms of their lives and their communities. One interviewing difficulty was connected with the time of year. People were sometimes difficult to contact because they were working, or off doing summer activities.

In general, I found the interview experience to be both enjoyable and a tremendous learning experience. People gave freely of their time and knowledge in formal interviews. I also enjoyed talking to people casually at the local stores and other gathering places. This work would not be possible were it not for people's generosity.

CHAPTER THREE: HISTORICAL AND GENDERED ANALYSIS OF NEWFOUNDLAND'S FISHING INDUSTRY

3.1 Introduction

For centuries, the Atlantic cod has been an important source of protein and income for Newfoundlanders (Hutchings and Myers, 1995). In this chapter, I summarise historical and contemporary literature on social dependence on, and interaction with, this resource from the late nineteenth century to the twentieth century. I begin with an historical look at the salt fishery, in particular at women's involvement in this fishery. This is followed by a description of the transition from the salt fishery to the fresh\frozen fish industry and what this has meant for women. Next, I explore the fisheries crisis in Newfoundland and critique fisheries "normal" science. This is followed by an examination of women's processing work and their roles in recent years. Then, I move to a general description of the TEK\LEK research in Newfoundland's context. I conclude by arguing that because of women's position, historically and more recently, they should be included in the analysis of fishery workers' ecological knowledge.

3.2 History of the Fishery

3.2.1 The Salt Fisheries

European migratory fishers probably fished off the coast of Newfoundland since the late fifteenth century. In the nineteenth century Newfoundland's migratory fishery developed into a settled fishery (Hutchings and Myers, 1995) that was primarily dependent on family labour. Families hired help when necessary (Neis, 1993). Harvesting and processing work were decentralised operations until 1949 (Antler and Faris, 1979). Productive, subsistence and reproductive work were combined and based on a relatively inflexible sexual and generational division of labour (Neis, 1993; Porter, 1993). According to Hutchings and Myers (1995), Newfoundlanders reaped much of the wealth of the inshore fishery in the nineteenth and twentieth centuries and Newfoundland's inshore catches surpassed offshore catches until the late 1950s.

Merchants largely controlled the fishery through the truck or credit system. Merchants bought the fish from fishers, selected markets, and set the price and cull of fish and thus the incomes of fishers. Producing the best quality fish and obtaining the best price from the merchant was of the utmost importance for the successful reproduction of fishing families and households from year to year. Merchants employed

men to grade fish, according to its look and quality. People generally considered the culling process to be exploitative because merchants controlled the prices and the transactions. Fishers rarely received cash for their product because they were often in debt to the merchant (Ferguson, 1996:31; Neis, 1993; Porter, 1993).

The decline of the Newfoundland salt cod fishery in the twentieth century has been partly blamed on a decline in curing skills (Alexander, 1977). According to this argument, the introduction of women and children, with supposedly inferior curing skills, in the production of salt fish reduced its quality in the late 19th and early 20th centuries (Ferguson, 1996). Ferguson argues that it is questionable that curing skills declined since women had an historical involvement in the production of salt fish since the 18th century and the skills, techniques, and knowledge they used were the same as those historically used to produce salt fish. Reductions in the quality of the product may, instead, have been the result of new harvesting technologies, such as the cod trap (1996:263-5).

Ferguson suggests that for a number of reasons a calculated decision was made to shift from light salting to heavier salting. First, the introduction of the cod trap resulted in gluts. Second, heavier salting decreased such

risks as unfavourable weather conditions associated with the lighter salting techniques; heavy salting techniques involved less time and less labour. Finally, shifting prices for fish encouraged heavy salting techniques (1996:162-4). In addition, Ferguson argues, the decline of the salt fishery was encouraged by corporate and political interest groups. They encouraged the shift from light to heavier salting techniques and created a discourse that emphasised the negative aspects of life during the salt fishery in order to control the directions the fishery would take (1996:277). Antler and Faris (1979) argue that policies and development schemes were part of a plan to replace decentralised family-based fishing operations with an industry controlled by plant owners and companies. Ferguson suggests that with more financial and long-term support from the governments, the salt fishery might have survived the 1960s (1996:278).

3.2.2 Women and the salt fisheries

It is difficult to make generalisations about making fish. Techniques and quality varied with types and classes of fish and across and within communities.[4] In addition, who actually participated in the shore crew and the extent of the

[4]See Ferguson (1996) for an in depth discussion of making fish.

division of labour varied amongst operations, depending on the gear used by the fishing crew (Ferguson, 1996; Porter, 1993:48). However, from the late eighteenth century to the 1950s, fishers in many areas, particularly on the north east coast of Newfoundland, depended primarily on women family members to produce light-salted, sun-dried cod fish on shore (Porter, 1993). Women gained access to some of the economic benefits of the fishery by marrying a fisher or working for a merchant or a family-based fishing operation. Women were denied direct access to the fishery by male heads of households who controlled the transmission of fishery knowledge, houses, land and equipment (Neis, 1993:191, 193). Women's access was further restricted by state laws that reflected patriarchal ideology, making women and children economic dependents. During times of economic slump, women often ceased doing shore work (Neis, 1993:191-2). Patrilinealism and a sexual division of labour compelled unmarried women, widows and daughters in poor families to locate work outside the community. Nonetheless, the identity of women from fishing families was linked to their work in the fishery (Neis, 1993:194; Porter, 1993).

Women played an indispensable role in the household-family-based production of salt fish. They did most of the shore work, especially the drying work, in many communities,

along with reproductive work, including subsistence activities and domestic and child care duties (Ferguson, 1996; Porter, 1993). Fishers' wives did not get paid for their work; nor did women have a formal say in the transactions between fishers and merchants. Accounts were in the names of men. Women were only rarely involved in these transactions; but some women gained economic control from time to time (Neis, 1993:190-1; Porter, 1993). Antler and Faris suggest that in the salt fishery women's processing labour increased the value of the final product by about forty percent. These profits were possible only because of the direct labour of women or hired help. The fishers did not have the time to do both the harvesting and shore work (1979:30). The saying that women were "more than 50%" recognised the importance of women's contribution and the family's dependence on women's processing, domestic and caring work for survival (Porter, 1993:92).

During the summer months, families were consumed with harvesting, processing and selling. All family members did their part in the operation. Young girls cared for younger children and helped with domestic work to free the women for "shore work." Sometimes children would also help in the processing (Ferguson, 1996; Porter, 1993). It was within this

context that familial patriarchy[5] existed and was maintained by husbands, fathers and the state (Neis, 1993).

3.3 Fresh\frozen fish industry

Between the 1950s and the 1970s, Newfoundland's salt fishery was gradually replaced by a frozen\fresh fish industry. The provincial and federal governments encouraged this transition both financially, in the form of loans, subsidies and transfer payments, and through the dissemination of a modernisation ideology (Antler and Faris, 1979; Wright, 1995a). The frozen\fresh fish industry was weak because it relied on the mass production of a single commodity for the U.S. market (Neis, 1991; Wright, 1995b, 1995c). The provincial and federal governments extended their control over the fisheries through increased regulation (Sinclair, 1987) and secured the shift from the salt fishery to a fresh\frozen fish industry through educational programs (Wright, 1995a), household resettlement (Antler and Faris, 1979), and welfare transfer payments (Neis, 1993).

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[5]Familial patriarchy is a term used to describe a system "in which power and authority over women and children was largely exercised in the home" (Ursel, 1992:2).

3.3.1 Gender ideologies in planning and policy

The sexual division of labour at work and at home, constructed by both patriarchy and capitalism, shapes women's labour process. Women's work is depreciated within the wage system. Women's domestic and caring labour is devalued because it is not paid, while women's paid work is devalued because it is paid less than men's labour (Porter, 1993).

The state encouraged the process of modernising and rationalising the fishery through the expansion of social welfare programs that were shaped by assumptions about the ideal family and gender ideologies. These ideologies denied women's traditional roles in the fishery and within fishing families (Neis, 1993; Wright, 1995a). Wright (1995a) found gender ideologies embedded in the fishery planning literature generated by the Federal Fisheries bureaucracy and the Department of Fisheries in the first couple of decades after Confederation. The message was that fishery-work was the preserve of men, perpetuating the ideology of separate spheres that allocates men to the public realm and women to the private. In this way, women's processing and reproductive work is and has been dehistoricized and concealed. The Newfoundland fishery has been characterized by a strict division of labour,

but the public and private worlds were not clearly separated (1995a:208-9).

Training and educational programs related to the fishery were aimed at men so they could adopt modern values and become the major players in the future fishery. It was assumed that women's role in the fishery would be minimal and restricted to "suitable" jobs. Women's most important roles were to be those of housewife and mother (Wright, 1995a:213-6).

3.3.2 Securing the transition from the salt to the fresh\ frozen fishery

The extension of the welfare state and the construction of processing plants strengthened social patriarchy[6] in the long run (Neis, 1993:196). Initially, these developments increased the economic independence of households, strengthening familial patriarchy. For a number of reasons, women were encouraged to withdraw from the salt fishery which in turn undermined familial patriarchy. First, the social welfare programs, especially transfer payments, offset the lost economic value of women's shore work (Antler and Faris, 1979:19). Second, women were eligible for UI when working in

[6]Social patriarchy is a term used to describe the modern welfare state "in which support for and control over women and children resides in laws, institutions and the state" (Ursel, 1992:2).

fish plants but not making fish (McCay, 1988:114). Third, transfer payments, such as family allowances, reduced the costs of reproducing the household. Women, not men, received family allowance payments. While this meant increased financial independence from the male head, and the weakening of familial patriarchy, women became increasingly dependent on the state (Neis, 1993:196, 202).

Resettlement was part of the plan to "modernise" Newfoundland's fishery, remove women from fishery work, and weaken household-based operations. This development scheme removed people from land and ocean resources that they depended on for survival and that provided materials for subsistence activities. Families replaced traditional subsistence activities with bought goods (Antler and Faris, 1979; Neis, 1993). Families needed more and more money to live and often found themselves in a worse economic position than during the salt fishery. Fishing households responded by investing more time and money into harvesting and technologies (Neis, 1993:201). While processing plants provided opportunities for women to increase cash income, child care and domestic duties restricted women's choices, strengthening familial patriarchy (Antler and Faris, 1979; Neis, 1993). Familial patriarchy both reduced the cost of reproduction and ensured that women supplied cheap labour (Neis, 1993:202).

The welfare state perpetuated gender ideologies rooted in familial patriarchy through its laws and policies in the post-war period. For example, minimum wages applied to men, not women, until 1955 in Newfoundland and separate minimum wages (with women's being lower) for men and women endured until 1974 (Neis, 1993:198). With "modernisation" came a home economics curriculum that emphasised gender roles and the ideology of separate spheres. However, by the 1970s, the idea of being paid for one's work was widely accepted (McCay, 1988:113).

3.4 Fisheries Crisis

3.4.1 Capitalism and ecological crisis in the 1970s

According to Hutchings and Myers, the period between the 1950s and 1990s was the most destructive time for the Newfoundland fishery "[i]n terms of harvests, spatial, and temporal variation in effort, technological advances in fishing equipment, and competition among fishing nations" (1995:57).

Plant workers have information about changes in fisheries resources and ways such changes have been masked by market and technology shifts. Incorporating plant workers into

the research will show us ways in which capitalist industries have responded to ecological crisis.

According to Neis (1991) capitalism was in crisis in the 1970s, in part because of ecological changes. In the case of the Newfoundland fisheries:

> ... both ecological and political forces limited capital's access to cheap, homogeneous raw materials. This helped to undermine the profitability of fordist technologies and labour processes and to increase the competitiveness of alternatives that were more flexible, less wasteful and more reliant on skilled workers (Neis, 1991:154)

In the 1950s, the fresh\frozen factory-based industry produced mostly semi-processed blocks of fish fillets for US markets (Neis, 1991; Wright, 1995b). This production did not require either skilled labour or intense managerial surveillance because consistency in size and quality of fillet were not required and because labour was not highly fragmented. After the block markets weakened in the 1960s, companies started relying on both inshore and offshore harvesting technologies, in order to have more dependable and year-round supplies of raw material, and building fish plants around the island which had access to flexible community-based supplies of labour. Because plants were scattered throughout

the island, workers had little bargaining power (Neis, 1991:161-3).

As women's unpaid 'consumption work' was moved out of the home and was replaced by workers in the formal economy, companies discontinued mass production and began specialised production. In addition, companies responded to the increased harvesting regulations in the 1970s by relying more heavily on the more flexible inshore fishery and by processing a broader range of species. Profit loss due to resource scarcities forced companies "to reorganize production and rely more on skilled workers in order to reduce waste and produce higher quality products" (Neis, 1991:165). Some plants introduced incentive systems and individual work stations and discontinued using machines associated with wastage and poor quality output. By the late 1970s, the position of fisheries-workers had improved because of changing markets and the increased demand for particular species and high quality, specialized products (Neis, 1991).

During the 1970s and 1980s many plants were restructured in response to market changes. Restructuring meant searching for new supplies of raw material and either substantial financial investment into new technologies and the reorganization of production labour or the implementation of labour intensive strategies. The 200-mile limit provided

access to new supplies of raw material and increased numbers of women workers, the sexual division of labour and incentive systems kept costs down. The shift to specialized production created such problems as increased employment and labour costs, and a need for increased managerial surveillance of workers' production and quality (Neis, 1991). According to Neis (1991), changes in the labour structure, managerial strategies, and in products produced for market, within the processing sector, were in part a result of ecological changes in the resource. They were a capitalist response to ecological change.

3.4.2 1985 to 1992: The Northern cod crisis

In the 1980s, the inshore catches of Northern cod decreased, while the offshore catches remained high. This can be attributed to the high mobility of gear used in the offshore fishery and the increased knowledge of fishers who caught northern cod (Hutchings and Myers, 1995). The 200-mile limit established in the late 1970s gave fishers access to new supplies of raw material. This meant that processing plants that relied on material from the offshore fishery experienced expanded employment. Women filled most of these jobs (Fishery Research Group, 1986; Rowe, 1991). The inshore fishery workers

felt the effects of decreases in supplies of raw material before the offshore fishery workers. Inshore fishers noticed changes in fish size, suggesting that the older fish had decreased in numbers due to overfishing. In addition, inshore fishers experienced increased effort while catch rates remained low (Hutchings and Myers, 1995; Neis, 1992).

3.4.3 Fisheries crisis and Fisheries science

According to Neis and Felt (1995), until the 20th century, fisheries science played a minor role in informing fisheries policy within the Newfoundland government. From the late 1970s, however, inshore fishers' fisheries knowledge and data from the inshore were marginalized in the stock assessment process at the Department of Fisheries and Ocean. Knowledge about and data from the inshore fishery were regarded as unreliable and anecdotal by fisheries scientists. They justified ignoring data from the inshore fishery and inshore fishers' knowledge for a number of reasons:

> the large number of fishers in the inshore; the complexity of the inshore fishery in terms of gear, local oceanographic variations, and climate; and the absence of any measurement of catch per unit of effort for the inshore (Department of Fisheries and Oceans in Neis, 1992:162).

Following the declaration of the 200-mile exclusive economic zone in 1977, the relationship between scientists and inshore fishers deteriorated for many reasons. First, the federal department employed more and more professional fisheries scientists, most of whom were non-Newfoundlanders. Second, the state increased and stiffened the fisheries regulations. Also, DFO introduced assessment methodologies based on quantitative population estimating models (Neis and Felt, 1995:12). Data retrieved from the offshore commercial fishery were considered rational and comparable to the data obtained from the offshore research vessel surveys (Finlayson, 1994; Neis and Felt, 1995).

According to Finlayson (1994), this fisheries science has been governed by a techno-utopian approach. This mechanistic approach allowed fisheries scientists to assume that sustainable management was possible through the manipulation of knowable variables such as natural mortality and fishing mortality (Finlayson, 1994:24-5). From the 1970s, fisheries scientists relied on a flawed scientific assessment method, partially based on catch and effort data. Until 1988, this assessment consistently resulted in excessive Total Allowable Catches (TACs) because of overly optimistic estimates of the biomass of fish stocks obtained from commercial catch rate data and research vessel surveys.

Fisheries science did not consider shifting effort from areas of low to high catch rates, the efficiency of new gear technologies, or unreported catches and other unreported activity (Hutchings and Myers, 1995; Neis and Felt, 1995).

According to Hutchings and Myers (1995), fisheries scientists tried to balance the variability of research survey vessel data by using commercial trawler data. However, this is problematic because commercial fishers do not randomly sample the fish population. Increases in their catch rate can be attributed to increases in harvesting efficiency rather than increases in stock abundance. According to Finlayson (1994), this approach reflected fisheries scientists' belief that stocks could be controlled by direct manipulation.

3.5 Women's Work in the Processing Sector

Women gained access to jobs in the harvesting sector in the 1980s, although their number is significantly less than in the processing sector. In addition, most of these jobs have been lost in the 1990s (Rowe, 1991:1). In the late 1970s and early 1980s women entered fishery-jobs in greater numbers, most of which are located in the processing sector. Women held approximately 60 percent of Newfoundland's processing jobs (Rowe, 1991:18). In particular, women filled an

increasing number of irregular jobs including part-time, seasonal and casual work. An expansion in irregular work may reflect an increase in production in the late 1970s and 1980s in response to market demands, recent reductions in supplies of raw material and the introduction of new technologies, or efforts to diversify production by processing new species, like crab and shrimp, which might be masking or balancing the unstable supplies of groundfish (Rowe, 1991:21). When plants concentrate on producing one species, workers experience fluctuations in work levels and plant closures due to resource shortages and market changes (Neis, 1991). Women's increased participation in the processing sector means that women collect the financial and social rewards of plant work but also that they experience direct financial losses in times of resource and market crisis (Fishery Research Group, 1986; Rowe, 1991:1).

Men's and women's jobs differ within processing. Women's work at the plant is less varied than men's. According to Rowe (1991), women who work at processing plants usually hold direct fish processing jobs whereas men hold indirect processing jobs and a wider range of positions. In comparison to indirect processing jobs, direct processing jobs are characterized by lower pay, shorter working periods, shift work, and are associated with less job satisfaction. As well,

the skills acquired in direct processing jobs are less transferable to other jobs both inside and outside the plant than the skills developed in indirect jobs (Rowe, 1991:6-7). Women remain working at the fish plant for longer periods than men. More women than men work at the plant as they approach their middle working years (Rowe, 1991:7). Despite this fact, women are less likely to have full-time and regular work. Instead, they predominate in part-time, casual and seasonal jobs (Rowe, 1991:11).

Women's attachment to work in the processing sector and the kind of jobs they hold mean that women plant workers are vulnerable in times of resource shortages and market changes (Rowe, 1991). Plants that depend on the inshore fishery operate on a seasonal basis, making it difficult to obtain regular positions. The supply of raw material for these plants is dependent on seasonal weather conditions and the seasonal availability of certain species to inshore fishers (Neis, 1991).

Research on women and their work in processing plants suggests that as more women acquired employment in the plants during the 1970s and early 1980s, the sex\gender segregation of work intensified (Fishery Research Group, 1986; Rowe, 1991:15). Women worked as packers and trimmers and performed light labour tasks. Women were underrepresented in management

positions, in the most skilled and highly paid jobs such as cutting and splitting, and in the trade or technical areas. Positions on discharge, in the holding room, freezer jobs, service, transportation and maintenance occupations, office work and most hand filleters (cutters), and filleting machine operator positions were generally filled by men. Women who worked in seasonal plants were more likely to work on machines or be hand cutters (Fishery Research Group, 1986; Rowe, 1991:18)

A number of factors encouraged sex/gender segregation within the processing sector after the 1980s. First, laws prohibited employers from paying men and women different wages for the same work. This meant that women were hired for jobs paying lower wages than the jobs filled by men (Rowe, 1991:15). Second, the introduction of an incentive system and individualized work stations discouraged movement between jobs (Rowe, 1991:15). Third, the plants lacked training programs. This meant that women did not have an opportunity to obtain work in jobs requiring more skill and paying higher wages (Rowe, 1991:16). Fourth, women were not encouraged to enter non-traditional jobs which were usually paid higher wages than traditional jobs filled by women (Rowe, 1991:48). Fifth, inadequate child care facilities also facilitated the sexual division of labour (Rowe, 1991:19). Sixth, different seniority

lists for day and night shift workers in some plants made it difficult for night shift workers to accumulate seniority that would make them less vulnerable during downtimes. In addition, women filled most of the night shift jobs (Fishery Research Group, 1986; Rowe, 1991:17).

Women have been underrepresented in supervisory and managerial roles in the offshore plants (Rowe, 1991). This trend has not been documented in the inshore fish plants. However, in the inshore processing plant that I studied, women were underrepresented in managerial and supervisory roles in the inshore fish processing plants as well. While expansion, automation and technological changes have somewhat eroded sex segregation, these changes have also encouraged deskilling and an increase in part-time work.

The sex/gender segregation and income gaps at work between men and women help to maintain the traditional sexual division of labour in the home. When domestic responsibilities require attention, women, rather than men, generally respond by leaving work. This pattern is encouraged by traditional roles and gender ideologies. In addition, women's work is often paid less than men's. Therefore, when women leave work, it is less of an economic loss for the household than if their husbands leave work. Women workers often lose seniority during maternity leave and time off for child and elder care,

perpetuating unequal incomes and seniority between men and women workers (Neis, 1993; Porter, 1993; Rowe, 1991).

3.5.1 Women's health and working conditions

Neis and Williams (1993) have found evidence of a number of work-related health problems, stressors and injuries associated with plant work in the 1980s. Plant workers experience stress at work due to shift work, intense and unsafe working conditions, lack of control, managerial surveillance, intermittent and accidental releases of hazardous fumes, a fast pace, monotonous and repetitive work, and social isolation. Repetitive strain injuries (RSI) caused by repetitive wrist and hand movements are experienced by plant workers, especially where there is little job rotation. Incentive systems make workers vulnerable to stress and injury. Chronic health problems, RSI and back problems are common health problems that limit job alternatives for fish plant workers (Neis and the Fishery Research Group, 1988).

Women's work related injuries and stress are exacerbated by the sexual division of labour and their unpaid, informal work at home and in the community. Women experience stress at work due to the limited availability of child care, fewer job alternatives than men at the plant, lower status and lower

paid jobs than men, the burden of the double day, less seniority, and harassment. Women experience a lack of mobility within the plant, especially during times of resource shortages, which leaves them vulnerable to unsafe environments or dangerous jobs. Crab plant workers, who are mostly women, sometimes experience allergic reactions to crab (Rowe, 1991). Women moving to "male" jobs experience stress because they are not familiar with the machines and have to use tools that have been designed for men (Neis and Williams, 1993). The sexual division of labour has meant that women in traditional female jobs are more vulnerable than men to work related injuries and stress. This explains the fact that there is a gender difference in reported stress. However, when men and women do the same work this difference disappears. Women report health problems more often and different symptoms than men because the work they do is different from that of men and many have worked at the plant for longer periods than men (Fishery Research Group, 1986; Neis and Williams, 1993).

3.6 Work, Home and Community

Women continue to be primarily responsible for caring and domestic responsibilities whether or not they work for pay in the formal economy (Gerrard, 1995; Porter, 1993). These

responsibilities limit women's mobility in looking for and participating in paid work. They often have little choice but to take jobs that are readily available (Porter, 1993). Some women find the part-time and seasonal work available at the local plant accommodating, even if tiring and unsatisfying, in terms of their household and child care duties. The double day is exacerbated by low earnings, limiting women workers' resources to hire child care (Neis and Williams, 1993; Rowe, 1991). Many women prefer night shift so they can do housework and look after the children during the day. With resource shortages, night shift work becomes more unstable (Rowe, 1991:19).

Research has shown that women's decision-making often takes into consideration household survival. They accept poor jobs because there are few other opportunities to earn cash in many communities, particularly for women, and they are committed to the survival of their households. Women and men may be willing to work in unhealthy and unsafe work places, especially when jobs are scarce and when the plant is the major employer in the area (Neis and Williams, 1993; Porter, 1993).

Community ideologies influence women's work. Fish plant managers may reflect community ideologies in their hiring policies. Managers may hire only one member per household,

usually the man, especially when work is scarce. Some managers may prefer to employ family members with the assumption that they have some understanding about plant work. Other managers may not hire women whose husbands have good jobs or jobs outside the fishery (McCay, 1988; Rowe, 1991). In fact, Porter (1993, 1990) found that in Catalina women's access to work was linked to patriarchal ideologies in the community.

Unemployment insurance regulation changes that include longer qualifying periods and shorter periods of eligibility make it more difficult for seasonal and part-time plant workers to draw UI, especially in times of resource decline (Rowe, 1991). Unemployment insurance is an important contribution to Newfoundlanders' incomes which are often close to or below the poverty line. Women's work decisions may be related to UI benefits. Women plant workers have particular difficulty qualifying for UI because they often hold irregular positions with low seniority. Many women have to leave work in the fall, whether or not they have their "stamps," because their young babysitters return to school (McCay, 1988; Porter, 1993). Because of the importance of unemployment insurance to the incomes of rural Newfoundlanders, the issue of whether or not a person needs to qualify for UI often becomes an important factor in management's hiring and lay off policies (McCay, 1988; Porter, 1993).

3.7 Critiques of normal fisheries science - TEK\LEK

Local and traditional ecological knowledges and "normal" fisheries science are different knowledge systems. A "knowledge system" includes "the taxonomic classifications, types and varieties of 'evidence', the interpretive rules utilized to draw inferences from evidence, as well as the content and social relationships" that help explain our environment (Pinch, 1986, in Neis and Felt, 1995:5). LEK, and fisheries scientific knowledge, are often applied in different spatial and temporal scales, use different methodologies and are produced in different social and cultural contexts (Neis, 1993; Neis and Felt, 1995:2).

Authors who have researched fishers' TEK\LEK argue that because locating fish is necessary to their survival, fishers possess extensive knowledge about this resource and the ocean environment. LEK literature suggests that fishers' taxonomies include categories of fish, as well as information about "behaviour, annual cycles, winds, tides, and references to time and space that often differ from those recognized by fisheries science" (Neis, 1992; Neis and Felt, 1995:5). Such local knowledge might identify barriers to sustainable fisheries. The data collected by fisheries scientists either do not include this type of information or it is ignored or

unavailable because of the type of assumptions and methodologies employed by scientists (Neis, 1992).

Fisheries scientists have relied on catch and effort data from the various harvesting groups in their stock assessment. Harvesters have helped generate scientific uncertainty and thwarted the effectiveness of management strategies. "[M]isreported catches of juvenile fish, the selective retention of larger fish (highlining), and illicit, 'under the table' fish sales" are factors that have distorted scientific assessments and facilitated overfishing (Neis and Felt, 1995:2).

Some of the goals of TEK\LEK research include identifying the prerequisites for a sustainable fishing industry and recommending management policies based on both local knowledge and fisheries science. In addition, TEK\LEK authors advocate the active participation of local people in this process (See Berkes, 1987; Felt, 1993; Freeman, 1992; Gadgil, Berkes and Folke, 1993; Kloppenburg, 1991; Neis, 1992 for such arguments).

Traditional or indigenous knowledge has gained more attention in the literature in current years. In the Newfoundland context authors have focused for the most part on

the ecological knowledge of male fishers[7] (See Felt, 1993; Hutchings, Neis, and Ripley, 1995; Neis, 1992; Neis and Felt, 1995; Neis, Felt, Haedrich, Hutchings and Schneider, 1995 for detailed discussions on fishers' local ecological knowledge). However, fish processing workers, like fishers, depend on fisheries resources for their livelihoods. Women possess insights that can supplement or provide an alternative to fisheries science and the ecological knowledge of fishers concerning the health of the ecosystem, and that can indicate shortcomings with management. Understanding processing workers' experiences on the job, and the contradictions that they meet on the job, can contribute to identifying the barriers to sustainable fisheries.

The TEK\LEK literature on fishers provides some initial insight into the local ecological knowledge of plant workers and women who made fish. Literature on the TEK\LEK of fishers has recorded opposing opinions concerning, for example, the health of the fish stocks (Felt, 1993) and I found the same variety of opinions from plant workers. We need to take into account factors that help shape perceptions of the resource in order to make informed judgements about the accuracy of

[7]I use the term "fisher" with some ambivalence. Firstly, because it is a term without gender, it denies the fact that fishing is an occupation that remains dominated by men. Secondly, some women with whom I have spoken who fish for a living also call themselves fishermen. However, the term fisher provides conceptual space for the small number of women who do fish for a living.

particular ways of knowing. For example, according to TEK\LEK literature and my own research the following factors help delimit fishery workers' knowledge: age, gender, geography, technology, ties to other social groups, length of employment, employment histories, the patrilineal transmission of certain knowledge, and spousal or household relations. Older residents have memories of abundance of currently depleted resources and can provide insight. Whether or not a fishery worker deals with the offshore or inshore fishery shapes his or her assessment of the stocks. The extent to which communities still have the same values as traditional fishing communities shapes the quality and quantity of the LEK of the residents. Finally, increased effort and competition, smaller fish, longer fishing days, reduction in the length of the season, changes in effort to make poundage and difficulty in qualifying for unemployment insurance are factors influencing the LEK of men and women fishery workers (Felt, 1993; Neis, 1992).

3.8 Drawing on women's experiences and knowledge

Women have been responsible for managing fishery dependent households and women plant workers have ideas about sustainable resources and communities derived from these roles

(Gerrard, 1995; Porter, 1993). Women in fishing communities derive knowledge about and from their environment through day to day experience and local interaction with nature and people (Gerrard, 1995). The concept local ecological knowledge (LEK), while still retaining the importance of intergenerational transmission, does not emphasize it. Rather it emphasizes knowledge derived through experience. In fact, older workers may have received information in the way referred to by the "definition" of TEK, whereas both the younger and older plant workers received knowledge by many different means of transmission in recent years. Because processing workers depend on the fishery for paid employment and food, they have some understanding of changes in fisheries resources and ways such changes have been masked by market and technological shifts. By drawing on women's experiences, roles and work; the knowledge they use to deal with daily problems at work and at home; and the knowledge derived from these new and changing experiences, we may identify some prerequisites for sustainable fisheries and reach a fuller understanding of the link between the social and natural worlds.

CHAPTER FOUR:

THE LOCAL ECOLOGICAL KNOWLEDGE OF WOMEN FISH MAKERS

4.1 Introduction

In this chapter, I explore the knowledge of women salt fish makers in Newfoundland who made fish in the first half of the twentieth century. Because I spoke in depth with only three women fish makers, I rely on other sources for additional information, especially Ferguson's (1996) work on salt fish making in the Bonavista region. I begin with a description of the typical seasonal work involved during the salt fishery in the early and mid 1900s. I proceed then to outline the process of, and techniques employed in the successful production of salt fish. Next, I describe the roles that men, women and children played in these fishing households. I describe women's ecological knowledge derived from their work experience and from their social relationships, particularly within the household. Finally, I conclude with an analysis of these women's local ecological knowledge.

4.2 Seasonal homes and work

During the fishing season, families would migrate from their winter to their summer homes, usually located within a few miles of each other. These summer homes were located near fishing stages where the fishers brought in the fish, and near the flakes[1] where the fish[2] was dried. It was necessary for families to be close to the flakes and the stages in order to protect these structures and the fish in the event of bad weather. As well, women had to be near both the flakes to do their shore work and the home to perform their domestic and child caring responsibilities (Ferguson, 1996:59).

During the summer fishing season, the women I spoke with and their families moved to summer homes where the family-based production of salt fish took place. Two of the women I spoke with lived in Bonavista and would move to Lance Cove each year during the fishing season. The other woman lived in Spillar's Cove and would move to her summer home near Elliston each spring.

According to these women, the wives of a fishing crew shared a house during the summer while they made fish.

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[1] "Flakes were large wooden platforms built from posts and shores, covered with long narrow logs ... and on top of these, spruce boughs on top of which fish was laid" (Ferguson, 1996:19).
[2] Newfoundlanders usually refer to cod fish simply as "fish" (Ferguson, 1996:1).

According to one woman, each had her own separate space in the house and her own kitchen. She remembers the work, and the women with whom she worked, fondly. She enjoyed the social work on the flakes. The women in a shore crew talked with and helped each other. A shore crew would help the women in other family operations, especially when it was not busy. One woman explained: "Everybody was the same you know ... if you had your flake of fish out and your next door neighbour had theirs put under ... you know they would help you."

According to these women, the fishing season might run from May to September, October or November depending on the weather. In the spring, the men jigged fish. Around June 21st, schools of cod fish followed the caplin inshore. Once the caplin arrived, the fishers put out the cod traps[10]. A breeze brought in the caplin and when the breeze settled, the fishers put out their traps.

The trap season, usually in the months of June and July, was the busiest time of the year for these families; it required intense and exhausting work and long working days (Ferguson, 1996). Women I spoke with recalled days during the cod trap season when the small open boats would come in loaded

[10]Ferguson describes the cod trap as "a type of fishing gear -- basically a very large box constructed from nets and with a one-fathom wide doorway. Another net called a 'leader' was run from the land or a shoal out through the doorway, leading fish into the trap" (1996:10).

with fish. These women worked on the flakes into the night, sometimes until after midnight, especially during peak or "scullin'"[11] season, when the traps were out in the water. Work became more relaxed after the caplin scull (Ferguson, 1996). One woman stated that work during the latter part of August, when fishers harvested squid, was slower.

4.3 The Process of Making Fish

In general, women organized and directed the making of fish and were especially integral to the drying work (Ferguson, 1996; Porter, 1993). In the Bonavista region from the 1920s to the 1950s, women played a particularly large role in the production of pickled fish (Ferguson, 1996:128). The women I spoke with said processing work started early in the morning and depended on weather conditions. Fishers brought in a load of fresh round fish and hoisted it from the boat, over the cliff, to the stage head in big boxes with a cable. Once the fish were on the stage, the throat of each was cut, the guts and head were removed, the fish was split, and the sound bone removed. Each split fish was then washed and salted.

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[11]The caplin scull is a term that refers to the time when cod fish arrive inshore following schools of caplin. During scullin' season, cod trap gear was employed and most efficient (Ferguson, 1996:55, 71).

Both men and women split and salted the fish. These women sometimes helped the men on the stage by putting the fish on the table, taking the guts out, and cutting off the heads. Women's primary responsibility, however, lay in the drying phase. After the fish had been salted, each fish was washed, and lay to dry in the wind and sun (Ferguson, 1996). These women laid the fish face up to dry for a period, then face down. This was repeated over the course of time. Below I give a brief description of "making fish" as described by Ferguson (1996). This summary describes the production of light-salted fish in Newfoundland before the 1950s. Pickled fish, a sub-class of light-salted fish, was produced in the Bonavista region.

> Making fish began at the point when cod was forked up from the boats at the stage head and went through the initial phases of cleaning and salting. This was carried out as quickly as possible in order to maintain good quality. In the cleaning phase, three or more people stood around what was known as a splitting table, usually in a splitting stage. The first person, called a cut-throat, literally cut the throat of the fish and then made a second cut down its belly. The second person, known as a header, hauled out the fish's guts, tore its head off and passed it to the splitter. The splitter quickly and skilfully split the fish open to its tail along its sound- or back- bone, laying it open, and then cut out the majority of that bone. Fish was usually washed quickly and then carried to a salter whose job was to cast salt on each and every split fish, laid open on its back.
>
> After it sat in salt for a prescribed period depending on the type of salting employed, the last

> phase - drying - began. The fish was taken from the salt, scrubbed clean with water and clothes or brushes, then usually left in a pile called a waterhorse to drain for a time. Following that, it was carried outdoors and up onto flakes where it was laid out to dry. With light-salted fish ... this drying period could last anywhere from twelve days up to six weeks depending on the weather, the size of the fish, and the curing method used to salt it ... Over a period of days, the final drying phase occurred, with fish becoming increasingly hard and dry, as it was spread, piled, re-spread, and re-piled (Ferguson, 1996:17-19).

4.3.1 Splitting fish

The number of women splitters declined after the 1930s (Ferguson, 1996:104). According to Ferguson (1996), splitting required skill, accuracy and speed. The splitter ensured high quality fish and a profitable return by doing a number of things. First, the splitter could not waste fish parts. Second, she or he ensured that the fish had a particular appearance (too much meat removed lowered the value of the fish). Third, she or he prevented the formation of and removed all existing blood spots. Fourth, the splitter removed the sound bone a certain way to get top price. Finally, she or he ensured knives were sharp (dull knives made for untidy cuts and lowered the cull and the price of the fish) (Ferguson, 1996:97-101).

4.3.2 Salting techniques

Salting techniques varied amongst fishing families around the island. One woman I spoke with explained that "her crowd" salted and pickled the fish in puncheon tubs for three days, then washed the fish on the stage. Both men and women were salters. However, from the 1900s to the 1930s in Bonavista, it appears that salting was done by women. Women salters were especially common in hook and line fishing households (Ferguson, 1996:106-7). Women I spoke with stressed the importance of an effective salter to the quality of the final product. Successful salting techniques were passed down over generations, from senior salters to the younger men or women (Ferguson, 1996:116).

4.3.3 Drying techniques

Once the fish was removed from the salt, it was washed. The women I spoke with said that after the salt was cleaned from the fish, they carried it up onto the flakes, which were built up on the banks. The damp fish were piled so as to let the water and pickle drain out. Each fish was spread on its back. When the fish dried and hardened, the backs were turned up to the sun. At night the fish were turned over, face down,

in case the weather turned bad (Ferguson, 1996:156). The women spread and piled the fish over a number of days. The wind and the sun dried the fish as women turned each fish again and again. One woman said that her mother-in-law, the director of the shore crew, would say: "You handle those fish now, the great big ones, like you handle your baby."

After it dried, these women piled the fish on top of one another into high faggots[12] in the evening. Faggots were gradually built higher and higher by placing fish on top of one another, day after day, as it dried. These faggots allowed the water to drain from the fish. Weather permitting, the fish were spread again in the morning (Ferguson, 1996:156).

4.3.4 Cod Livers

Before the fish was gutted, the liver was removed (Ferguson, 1996:96). According to the women I spoke with, fishers sold cod fish livers to merchants. These livers were stored in a cut-off barrel and rendered into cod liver oil by the fishers or sold to merchants with liver factories. This job was sometimes done by children (Ferguson, 1996:96). The

[12]Faggots were piles of fish. They "were constructed with their first tier back-down and the rest of the tiers back-up and fish was laid heads and tails on each tier. The pile tapered up to a single fish as it rose and this last fish was generally a larger one and formed the top overlapping shingle of the faggot" (Ferguson, 1996:156).

women I interviewed said the livers varied in size and quality, but they all went into the same barrel. These women recall that trucks collected the liver and, in exchange, issued a "liver note" which could be taken to the store to exchange for money or goods. When the Bonavista Cold Storage plant was established in 1939 (Wright, 1995b), their husbands ceased selling cod livers to the merchant. Livers were then discarded, or used for personal consumption.

4.3.5 The Appearance of "Made" Fish

When the fish was "made" it had a white, floury appearance and was dry and hard. Women I spoke with often described this fish as "beautiful": "Oh the fish looked beautiful, you know, clean, 'cause you had to know how to salt fish to have it good, some people have theirs slimy, they didn't know how to salt it see." Women I spoke with said they could tell if a salt fish was good quality by looking at it. When the fish was made it was placed in the store, located on the flakes, until it was shipped. They said that fish had to be the best quality possible when it was sold. If shipping was delayed for a few days, the crew might spread the fish again to dry outside once more and "colour them up" before grading (Ferguson, 1996:159). The entire process of making fish was a

lengthy one and these families depended on their fish to be of excellent quality in order to get the best price.

4.4 "Shipping out" the fish

The dried fish was brought to the local stores where it was graded or culled in the fall of the year. The women I spoke with said culling took into account the appearance of the fish, such as whether or not the fish was split properly. One woman said that she personally could not tell the difference between the grades, only whether the made fish was poor or high quality. This point suggests that grades were not a direct reflection of quality but rather a reflection of the power relations within the mercantile system. Fishers' suspicions about the fairness of the culling process support this claim (Ferguson, 1996). Women I spoke with also suggested that salting masked the quality of the original fish. Once fish was properly made, it was all the same quality and taste. The cull the fish received determined where the fish would go and how much the fisher would receive for his and his wife's labour. Fishers might or might not have cash to spare once they paid their debts to the merchants and the stores (Ferguson, 1996; Neis, 1993; Porter, 1993). One woman commented that maybe those families with their children raised

had some money left over, but younger families had no money. She says that she and her husband had no substantial money until she went to work in the fish plant.

According to these women, their families rarely had any money. One woman recollects times when her parents gave dry fish to her to exchange for biscuits or money at the local store. However, Ferguson reports that people were careful about exchanging fish for items that were not necessities (1996:135).

One woman I spoke with explained the importance of working so hard during trap season:

> ... try to get what you could then, that was our livin', nothing else, there was no unemployment [insurance] then first when I got married, no there was nothing **for the fishermen**, only what they made, that's what they had to live on ... (emphasis added).

Interestingly, she did not mention her own economic role in the family operation. Women were not paid for their processing efforts during the salt fishery; "no, never got a cent," as one woman put it. The work simply had to be done in order to survive. One woman said she did not get paid for her work but hinted that she had some economic control at the household level:

> No pay... you just share what he got in the fall, that's all right ... I didn't get paid in such a way that no woman I guess gets paid as a housewife, in a sense of getting paid. But again you know, if you're looking after things and he brings home a check and gives it to you and you know you look after the bills and .... you're paid.

Women often handled money within a household suggesting an equal and reciprocal economic relationship between husband and wife. However, "much evidence in the handling of family budgets suggests that while women often 'manage' money, it need not necessarily imply real control" (Porter, 1993:49). Researchers'depictions of the sexual division of labour and the economic role of women in fishing communities have reflected androcentric assumptions (Porter, 1993). "The economic unit was the family, and the head of that unit was the fisherman. Combined with ideological pre-eminence of the fisherman as a catcher of fish," (Porter, 1993:48) researchers have misrepresented women's economic contributions and roles. Some authors have examined the economic role women played in the salt fisheries (Antler and Faris, 1979; Ferguson, 1996). The work of women substantially increased the economic value of the fish. Their work, done correctly, was critical to making a living and because of this fish making was allocated status within communities (Ferguson, 1996). In fact, "...

Newfoundland men unhesitatingly credit women with at least half the work of the family" (Porter, 1993:48).

4.5 Threats to making fish

The traditional and practical knowledge, skills and intensive physical labour allowed the workers to effectively avoid producing poor quality fish (Ferguson, 1996:125). There was a general consensus among the women I talked with that the quality of the salt dried fish depended largely on weather conditions and the workers' skill and ability. They skilfully averted problems which reduced the quality, and thus the price, of the final product.

Women mentioned a variety of barriers to making good fish. First, damp weather prevented fish from drying properly. Damp fish was also vulnerable to fungus and slime (Ferguson, 1996:161). Women I spoke with scrubbed the fish to ensure that it would not get mouldy in damp weather. A woman compared fish developing mould to wet clothes developing mould when they were not dried fully. One woman explained that a "good wind," like the wind that was needed to dry clothes on the line, was needed in order to make high quality salt dried fish. Second, flies spitting on the fish could result in maggoty fish (Ferguson, 1996). The women I spoke with constantly washed the

fish to prevent spoilage caused by flies "spitting" on it. Women cleaned the fish with pickle and salt when flies "spit" or laid eggs in it. A good salter was extremely important in these circumstances. Finally, in hot weather fish sometimes got sunburnt (Ferguson, 1996:161). Sunburnt fish was edible if it had been salted properly. However, it would fetch a low price and so was usually reserved for personal consumption (Ferguson, 1996:168). According to the women I spoke with, they had to prevent fish from getting sunburned and from splitting in the heat. One woman described how her "crowd" placed a quilt over the fish to protect it from nature's elements. On a hot summer's day the fish was in danger of spoiling. Salt could be applied to the fish but it would melt on the fish, and so women had to salt it and wash it, re-salt it and re-wash it.

There was a consensus among these women that the weather had changed in their lifetimes. They said that the summer months were much hotter in the past when they made fish. They stated that it would not be possible to make fish in the mild and damp weather of recent years. These women concluded that a good year, in terms of fishers' harvesting efficiency and the quality of the processed fish, depended on the weather.

4.6 Fishing Crews and Shore Crews

According to the women I spoke with, women generally began making fish when they married. Ferguson (1996) says these women were apprenticed by the senior fish maker of their shore crew, usually their mothers-in-law. However, this trend may be more typical in cod trap operations than in smaller hook and line operations (Ferguson, 1996:125). In a cod trap operation, the shore crew consisted of two or three women, related by marriage, usually under the direction of the most senior woman. In a smaller hook and line operation, the shore crew often consisted of one woman, accompanied at times by her husband and children. A wife in this situation would be the splitter and salter, in addition to her drying responsibilities (Ferguson, 1996:131-2). The husbands of the women I spoke with were part of trap crews usually composed of male relatives, brothers, the father and sometimes friends. The composition of the crews changed as members left to start fishing crews with their sons. According to the women I spoke with, when men moved from one fishing crew to another, their wives also moved from one shore crew to another, following their husbands.

Making fish was the duty of a fisher's wife, an obligation to the husband. One woman explained:

> ... you would never talk very much 'cause you was expected to do it, you know it was just a man's world I think and you was expected to. Some people didn't do it I suppose, but you know if you married a fisherman you expected to do it ... now today it's different you know.

This same woman suggested that she did not feel oppressed by these circumstances, rather it was part of a traditional way of life. She continued: "... You grew up, you saw your parents do it ... now when you start to work and then you got independent then I guess you see the difference, but I never felt that way."

According to the women I spoke with, the men of their fishing households were on the water and had no time to process the fish. However, if they were not otherwise busy, it was not uncommon for men to be involved in the process of making dried salt fish. If the men could not fish due to poor weather conditions, they helped with the shore work and women might be temporarily relieved of some processing work. According to Ferguson, men and children helped with shore work when such conditions as the weather threatened the quality of the fish, and thus their potential earnings and quality of life for the year to come (1996:165). Rain could be potentially devastating for the production of high quality made fish. Thus, when it rained, everyone helped move the fish out of the rain.

Women I spoke with said that, under normal circumstances, children did not make fish. One woman remembered helping her father with the fish as a child but added that this contribution was not expected. However, another woman said that children never made fish, especially young boys, "... we wouldn't let little boys out there." According to Ferguson (1996), children were not allowed to do much of the work because they were not careful enough.

In addition to shore work, women were responsible for domestic work, gardening and child care (Ferguson, 1996; Porter, 1993). Some men recognized that women worked harder than men because they performed domestic and caring duties along with fishery work (Ferguson, 1996:121; Porter, 1993). According to the women I spoke with, older daughters cared for the younger children. When this help was not available, women had to care for small children while they worked on the flakes. One woman remembers making a home-made play-pen from a sawed-off puncheon[13] tub and placing her babies in the tub while she worked.

While men fished, these women prepared meals for the family, did the housework, and tended gardens and animals. Women had "piles of gardens" as one woman put it. Women's

[13]A puncheon tub is a large watertight barrel used for shipping molasses.

involvement with fish extended beyond the flakes to the gardens. Women said they provided the gardens with sustenance in the form of fish fertilizer. They spread cods' heads, guts and caplin on cabbage, turnip and other vegetables to ensure the best quality vegetables. Sometimes fish discards were also used for animal feed (Ferguson, 1996:109).

Children helped in the family operation by doing chores that the mother and father did not have time to do during the fishing season. Girls usually performed some of the domestic and caring work. Children were expected to partake in various chores in order to get more work done and to learn the skills they would need later in life (Ferguson, 1996:27).

Because of the intensity of the fisheries-related and gardening work during the summer months and its importance to their survival, this work sometimes took precedence over children's immediate needs. "This was not overly harsh and it was for these children's long term welfare that the fish and gardens had to take this precedence" (Ferguson, 1996:27).

4.7 Seasonal Differences in Raw Material

According to these women, the size, quality and texture of cod fish were directly linked to the season it was harvested, weather conditions and the gear type. The women I

spoke with described the fall cod fish as a tougher, harder, bigger, heavier fish. One woman said it was "nice fish". According to these women, fall fish was a better fish to eat and received the best price when sold. Three reasons were given to explain this. First, fall fish was a better fish in part because it was harvested by trawls and hook and line. Second, the fall, cool, dry weather was more conducive to making high quality fish. Third, fishers may have received a higher price for fall fish because fish was scarcer in the fall.

These women indicated that the summer cod fish, that which was caught using trap gear in June and July after the caplin had arrived, was a thick fish, and sometimes full of caplin. Summer trap fish had a softer texture than fall fish. Three main reasons were given to explain this difference in texture. First, women voiced concerns about cod fish confined and piled in traps, sometimes for an extended period of time, if the fishers were not able to haul the trap for a day or two due to weather conditions. They linked this to soft texture. One woman stated that some trap fish would have to be discarded because it was too soft to work with. However, she said trap fish was still "good" fish, but then again it was "all good fish then, beautiful fish." Second, the size of the fish depended on the gear used and traps harvested smaller

fish than the hook and line or trawls used in the fall of the year. The trap fish was between 16 and 20 inches in length. Finally, women said the hot weather made the texture of summer fish softer.

4.8 From the Flakes to the Plant

In the 1940s and 1950s, these women's husbands starting selling their hook and line fish before and after trap season to the Bonavista Cold Storage plant. With the establishment of this plant in 1939 (Wright, 1995b), these women spent less time making fish. Women continued to make fish during trap season. According to one woman, selling the fish caught in the spring and fall to the Bonavista Cold Storage plant was wonderful because it meant less work for the women. Before the establishment of the Cold Storage, all fish besides that immediately eaten had to be salted. At first the Cold Storage plant could not handle all of the fish that the local fishers caught, so these women still made fish, but not as much. It appears that in the late 1950s fishers started to sell all or most of their trap fish fresh. According to one woman, some families later salted fish in salt bulk and sold it.

These women who worked on the shore later moved into the processing plants. According to one woman, families continued

to make fish: "... until the plant came into effect and then they started taking the fish fresh ... and then the women was not involved as much as they used to be." This woman described her move from the flakes to the fish processing plant as a removal from the fishery.

4.9 Women's knowledge about Harvesting

Women collected information about fishing from their husbands through discussions about household finances, unemployment insurance, and fishing effort (Gerrard, 1995; Porter, 1993). These women had some idea about where their husbands caught fish. They knew the locations of trap berths and used land marks to describe the locations. One woman explained that in a bad year gear might be moved. Another woman said, however, that she did not take an interest in knowing the location of her husband's trap berths because she was younger than the others when she made fish.

These women recalled years when their husbands caught little or no fish. One woman cited 1931 as a particularly bad year for fishing families in the area. She remembers that people could not pay their bills because of poor catches. Another woman said that in 1968 the fishing results were so poor that her husband joined a fishing crew on another boat.

According to one woman, there is a difference between poor fishing years then and the current situation. In the past, fish was scarce in particular bays, whereas today fish is scarce on a larger, even global, scale.

The women whose husbands continued to fish until the moratorium noticed a decrease in the size and the amount of fish caught in the late 1980s and early 1990s. One woman maintained that trap fish had always been smaller than longliner[14] fish, so it was difficult to tell whether changes in the size of the fish were a result of changes in the gear her husband used or actual decreases in the size of the fish. In the late 1980s and early 1990s, despite increased fishing effort, their husbands caught less fish and found it increasingly difficult to qualify for unemployment insurance benefits. Fishers discussed with their wives their difficulties in catching fish in the last few years. Women noticed changes in the fish when they prepared fish for family meals. In comparing today's fish to the fish they worked with on the flakes and ate, they noticed differences. As one woman put it, "[You] can't get fish like you got then."

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[14]Longliners were introduced to the Bonavista area in the 1950s (Sinclair, 1987:46).

4.10 Women's ecological knowledge

> The making of salt fish required the careful application of a tremendous body of traditional knowledge. It required a continual assessment of the following variables: weather patterns, the amount of fish at various drying stages, the state and quality of that fish, and the people available to carry out the various tasks involved in the extended drying process (Budgell, 1979:11 in Ferguson, 1996:124).

Women involved in the home-based production of salt fish offered detailed knowledge about the seasonal differences in raw material. These women knew how gear types, weather conditions and seasonal rhythms of nature affected the texture, size and quality of fish. A common theme reiterated by women who worked on the flakes was that the fish they made and ate was always a "healthy" mixture of sizes, texture and colour. These women remembered the "wonderful", big, and fat, fish of the past and sadly noted their disappearance. Despite this, women said that they did not really consciously take notice of the seasonal particularities of the fish because they were young and were not concerned about them.

Women fish makers of this era held extensive knowledge about the techniques and processes involved in the successful production of salt fish. The more knowledgeable, skilled, experienced and attentive the shore crew, the higher the quality of the salt fish they produced (Ferguson, 1996:126).

Drying entailed traditional practices, expert knowledge, and difficult physical labour (Ferguson, 1996). For example, speed was regarded highly, when combined with quality workmanship, because it meant the production of more high quality fish which yielded high prices. This meant a relatively comfortable year for fishing families.

Exactly how a person aquires knowledge is complex. Women I spoke with acquired some knowledge directly, through their involvement in the processing of fish, and some in more indirect ways through discussions with their husbands and through doing the books. The women I spoke with had aquired a vast amount of ecological knowledge through their processing work on shore and their reproductive work within the household. This knowledge was essential for the successful reproduction of the household. These women's knowledge included not only information about the raw material and its production, but also about household and community relationships. They knew what was necessary to survive in outport Newfoundland before Confederation. Women fish makers' ecological knowledge was intimately tied to their roles within and dependence on the inshore fishery. Their knowledge reflected the importance of the inshore fishery and the production of salt fish for reproducing households. People's

lives and work were intimately guided by the rhythms of nature.

According to Ferguson (1996), men and women, who participated in the salt fishery, remember the hard work, the poverty, the uncertainty inherent in any dependence on nature's elements and resources, and the lack of education and employment opportunities associated with life during the era of the salt fishery. However, these people also remember the positive side to this life when the fishery did provide a comfortable living (Ferguson, 1996:183). The women I spoke with remembered the social work involved in the production of salt fish, the independence in living off the land, and the status and satisfaction derived from their work. In order to ensure the survival and the reproduction of their households, these women had to be knowledgeable about nature. They knew how to successfully produce salt fish, how to fertilize and successfully grow gardens, and teach their children the necessary survival skills.

CHAPTER FIVE: THE LOCAL ECOLOGICAL KNOWLEDGE OF WOMEN FISH PLANT WORKERS

5.1 Introduction

The work, community and family lives of fisheries workers have been greatly affected by the shift from the salt fishery to the frozen fish industry. Women salt fish makers worked intimately with nature. Their lives and work were defined by the seasons, weather, and the natural migratory patterns of fish. Fish plant labourers, especially those working in an offshore plant, work in environments that are mediated by technologies and managerial strategies over which they have little control. Technologies, especially those used in the offshore fishery, sometimes marginalize nature with locating technologies, and sophisticated boats and gear. However, women engaged in processing work, both on the flakes and in the plants, connect their work to the survival of their households.

Part of my research has focused on using women's definitions of quality and perceived changes in work and raw material as indicators of ecological awareness. The discussion and analysis that follows is based on interviews with women processing workers. I evaluate the data retrieved from these

interviews by looking for general themes and consensus and by using secondary sources. Below, I explore some of these indicators, as articulated by women who worked in fish processing plants. I discuss contradictions in women's work at the processing level created by mismatches between, for example, raw material and market demand, and raw material and technologies. Women pointed to a variety of experiences and tensions at work related to practices that encouraged wastage. In times of resource decline, plant workers noticed changes in the quality and quantity of fish. Women fish processing workers noticed changes in raw material, fish quality, and their work over the years. I must qualify my discussion by stating that I will be presenting somewhat general and consensual themes but consensus did not always exist.

In the 1970s and 1980s, processing plants were restructured and expanded, and management introduced new technologies and strategies in an effort to make a wider variety of products and eliminate resource-wasteful technologies and products. These changes were in response to the extension of the 200-mile limit, changing markets and resource shortages (Neis, 1991; Rowe, 1991). Plant workers' knowledge is acquired through their direct engagement in a labour process, which is shaped by these technological changes and managerial strategies (Kloppenburg, 1991). Because plant

workers experienced changes in their labour process, they were made aware of changes in the resource. Below, I describe women's knowledge which was mediated by these changes. First, I provide a description of the processing plants and the sexual division of labour where the women worked. Next, I describe indicators of ecological awareness and knowledge: changes in hours of work, ecological knowledge as indicated through technology, tensions in work performance, changes in other species as indicators of ecological awareness, mismatches between products and raw material\ marketability, and their definitions of quality of raw material. Finally, I summarize some of the themes found in this analysis on women's ecological knowledge.

5.2 Description of the plants

The Bonavista fish plant was an inshore, seasonal plant that processed cod fish, other groundfish and crab. Hazen Russell, a director at Job Brothers, established the Bonavista Cold Storage in 1939. Job Brothers was the pioneer company that led Newfoundland into the era of the frozen fish industry (Facey, 1976; Wright, 1995b:3-4). Bonavista Cold Storage received government financial assistance during the Commission

of Government period[15] (Wright, 1995b:4). The crab processing area was added to the plant in 1969. In recent years, this plant employed up to 400 people when operating at full capacity with two shifts working at the fish, and two at the crab. The plant workers are unionized with Fish, Food and Allied Workers Union (FFAW/CAW) and Fishery Products International owns and operates the plant. Since the Northern cod moratorium in 1992, the plant processes only crab.

The Catalina plant is a large, modern plant located, not in Catalina but within a neighbouring community, Port Union. It is also owned and operated by Fishery Products International. When the plant opened in 1957, it operated on a seasonal basis and was supplied with mostly inshore fish. After 1973, Fishery Products, its former owner, began to develop a trawler fleet at this plant. The plant then shifted to year-round production. The plant and production floor were reorganized, expanded and restructured (Fishery Research Group, 1986:289). The Catalina plant processed other species of groundfish on a much smaller scale than cod.[16] During the

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[15]Commission of Government was established by the British parliament from 1934 to 1949 to replace Newfoundland's Responsible Government (Wright, 1995b).

[16] Fish goes through a number of hands and machines from beginning to end. Once on the production floor, fish is filleted either by hand or by machine. Machine cut cod is first put through a mechanical header. Then fish is skinned by machine. Fish cut by machine goes to the "boners" who remove the v-bone and other bones and defects. Hand cut cod does not go to the boners but rather directly to the trimmers and sometimes the graders. Trimmers remove any defects and sort out different cuts.

late 1970s and 1980s, both day and night shifts were in full production for most of the year and additional seasonal workers were hired for the processing of northern cod, usually from January to May. This was the busiest time at the plant. From all accounts it seems around 1000 to 1200 people were employed, including inside and outside workers and staff, when the plant operated at full capacity. The workers at the plant were unionized with the FFAW (Fish, Food and Allied Workers Union). The plant closed in 1992, after the declaration of the northern cod moratorium.

5.3 The sexual division of labour

Just as in the inshore salt fishery, the sexual division of labour in a plant influences workers' perceptions of changes in the health of fish and crab stocks by creating different work experiences for male and female workers. Women and men at the Bonavista and Catalina fish plants held different jobs. The women held mostly traditional female jobs, such as packing. Men worked outside and inside the plant,

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Graders sort fillets by size and separate fillets with defects which then go to the trimmers. Fish is then packed according to orders and frozen. The frozen fillets are stored in cold storage. Any parts that are not used are minced and sold as block, a lower quality and lower priced product. Any unedible parts leave the production floor and go to the fish meal plant to be used for fertilizer and animal feed (Fishery Research Group, 1986:302-3).

whereas women were limited to inside work, usually on the production floor. For this reason, most women did not see the fish when it came into the plant. This may explain why most of the women felt comfortable speaking only about their particular job and not about other areas of the plant. What women saw at work was limited and defined in part by the sexual and industrial divisions of labour. For example, one woman stated that the size of the fish that she worked with over the years seemed to change. However, she also pointed out that other sizes of fish may have gone to other areas of the plant for different products or cuts. She could not be certain.

Cutting was, and still is, a prestigious job that is dominated by men in both the Catalina and Bonavista plants. In the mid-1980s, the Catalina management hired a couple of women for cutting positions, but most women never applied, in part because they said they feared working with knives. Women also hinted at social pressure and norms that discouraged women from applying for cutting positions. After the expansion of the plant in 1980-81, there was an increase in positions at the plant and not enough men to fill them. Women were hired for trimming, boning, service and grading jobs (Fishery Research Group, 1986:408). The increase in jobs was the result of restructuring and reorganizing labour in order to meet

market demand for specialized products. Women were hired to fill these jobs, even those which were previously considered male jobs. Women tended machines, such as the IQF tunnel,[17] but they never operated machines. Men worked with the plate freezers. Women also filled boning and weighing positions in the Bonavista plant. Packing remained a female preserve in both plants. One woman said: "...it didn't seem right for a man to be packing, I don't know why, but that was always my opinion."

From all accounts it appears that there were roughly the same number of men and women working at both the Bonavista and the Catalina plants in recent years. Yet, women were underrepresented in supervisory positions. A couple of women were hired as forewomen at the Catalina plant. However, one woman suggested that these women appeared uncomfortable supervising women with whom they had previously worked. The same woman also claimed that women sometimes applied for supervisory positions, never intending to take the positions. They applied just to see if they would get the job. Forewomen tend to feel "alienated and isolated." Forewomen struggle to negotiate their roles as supervisors and their understanding

[17]This is a method for freezing cod, flounder tails and fish nuggets at the Catalina plant. Fish is laid on a conveyor belt and it freezes as it slowly moves along the length of the tunnel (Fishery Research Group, 1986:328).

of women's positions and work at the plant (Fishery Research Group, 1986:412).

5.4 Changes in hours of work

Women's hours of work changed over time, suggesting that something was happening either ecologically or economically or both. Such changes in work had an impact on their income, their occupational health, and so forth. Shorter fishing seasons translated into earlier plant closures. Both fishers and plant workers found it difficult to qualify for unemployment insurance, especially those depending on the inshore fishery, and new casuals[18] in the Catalina plant.

Women at the Bonavista plant experienced changes in their hours of work due to resource shortages. Hours of work at the Bonavista fish plant depended on the amount of fish the inshore fishers harvested to be processed at the plant. Trap season furnished the Bonavista plant with the largest amount of fish. Employees worked more hours and overtime during this season and a second shift was added. The second shift became a

[18]A casual worker was not a regular worker at the plant. The company was not obligated to ensure full time hours to casuals. Rather, they were asked to work as needed. However, when the plant operated at full capacity during peak season, a casual worker might work full time hours.

more permanent feature probably due to increased machinery and greater effort on the part of the fishermen.

> In the main season, like the trap season, you'd get night shift in, probably they get four or five weeks and that was it. Well I mean the goal was with the fish that was it and when that was finished they was let go.

However, overtime and hours of work decreased from the mid-1980s to the closure of the plant in 1992. Because the Bonavista plant was almost entirely dependent on the inshore fishers and the seasonal migratory patterns of fish, the inshore workers found it more difficult to qualify for UI than workers in the offshore fishery, and they felt these effects earlier.

The Bonavista plant operated on a seasonal basis, usually starting no earlier than March and lasting as long as December. However, the operating season of the Bonavista fish plant decreased in length due to shortages in raw material in the 1980s and 1990s. This situation combined with changes in UI regulations made it more difficult for workers to qualify for UI, especially those with less seniority. When work was scarce the "older hands" or those with most seniority would be the ones to get the work. Often even the most senior workers barely qualified for UI in the 1990s. Bonavista workers

sometimes took a layoff when they got their stamps[19] in order to give other workers an opportunity to qualify for UI. It was a way of accommodating more workers at the plant. This type of work sharing became less common in the late 1980s and the early 1990s when work became scarce.

The Catalina offshore plant operated almost year-round, usually 40 to 48 weeks a year in the late 1970s and the early 1980s. Whether or not a worker experienced difficulty getting work, or qualifying for unemployment depended on his\her job at the plant and on seniority. The season was gradually cut down by 2,3 and 4 months starting in the late 1980s. The offshore plant's busiest season, the Northern Cod season, was cut back first by a few weeks. While it originally ran from October or November to May, sometimes even June\July, it was cut back to April, March and then February. In addition, there were more lay offs. One woman said: "At the end of it you didn't try to put in for any holidays because of course you were off, you had time off."

Most of the workers in the offshore plant, including the seasonal workers, had never had a problem qualifying for unemployment insurance because there was plenty of work due to its year-round operation. However, as work became more

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[19]Unemployment insurance benefits are determined "on the basis of the average of insurable weekly earnings" (McCay, 1988:116). A stamp is an insurable week.

uncertain, workers, especially seasonal[20] and casual workers, and those with low seniority, experienced layoffs and reduced hours. Management called fewer and fewer people back to work:

> You'd notice that it wouldn't be so many workers there, you go into the lunch room at times and the lunch room be filled, but right at the end of it you could, I mean, there's empty spaces all over the place, right?

Women had particular concerns about qualifying for unemployment insurance benefits when they were pregnant[21].

Occasional delays and uncertainty in hours were always a feature of work at the Catalina plant, but it appears that work hours became more uncertain in the late 1980s and early 1990s. From the late 1980s, work was slower and there were later starting and earlier finishing times especially at the end of the work week. Originally, workers were able to get plenty of overtime either on Friday or Saturday, especially on night shift and holidays. By the early 1990s, overtime was no longer available. The female Catalina plant workers experienced cuts in hours and days per week. Six-day weeks

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[20]When seasonal workers were laid off after the Northern Cod season, they sometimes stayed back as casuals to continue working. There was, however, an informal, unwritten rule that if you already had your stamps, you went home to let other casuals get their stamps. There was social pressure to abide by this rule, especially in times of resource and work scarcity.

[21]Women required more weeks of paid employment when pregnant to be eligible for UI when off on maternity leave.

were reduced to five- or four-day weeks. Work on Saturday became less common. Casuals, many of whom are women, found the hours especially uncertain. As work became scarce, they had to give up their employment to regular workers, whereas in the past there was enough work for both the regular and casual workers. One Catalina worker noticed a decrease in her hours from about 40 to 50 hours to the 33 paid hours a week, which the company was obligated by contract to provide to regular workers.

Women related these changes in their work to a decrease in the amount of fish coming into the plant due to quota cuts, actual declines in the fish stocks, and a decrease in the size of fish. Although there were no inshore quotas and no cuts were made to the inshore allocation after 1982, women at the Bonavista plant suggested that they were finding it difficult to qualify for UI because boats brought in less fish and thus there was less work. A woman commented: "People that got a lot of fish was coming in with none." Another woman simply said "the fish was not so plentiful" over the years.

5.5 The Impacts of Technology

The changing technology in the plants and increased automation influenced fish processing workers' perceptions

about mistreatment, quality and wastage of the resource. Women's perceptions varied according to how much technology was put in place at the plant where they worked and the particular machinery with which they were in contact. Reorganizations in the division of labour in a plant may have been a result of market change, technological change and/or ecological change.

FPI introduced new set-ups and more machinery and equipment over the years at both the Bonavista and Catalina plants in response to resource shortages and market demands. The machines quickened the pace of work and increased production. The general trend seemed to be towards replacing hand work with machinery and technology. There was tremendous financial effort put into expanding and modernizing the Catalina plant, in particular in the early 1980s, and the company purchased additional draggers. The company looked forward to "bigger and better" things, as one woman put it. This expansion created much additional work and made it possible for many casual workers to gain regular employment and opened up nontraditional areas of work for women (Fishery Research Group, 1986).

There was a general consensus among the women interviewed that because machines processed more fish at a faster pace, an increase in the amount of machinery at the

plants meant more fish was needed to keep the plants operating[22]. Machinery pushed the fish through the plant faster, and when this was coupled with resource scarcities, it translated into less work. Some workers felt pressured by machines. Workers found it difficult to discern whether the machines or the incentive system (discussed below) or performance requirements had more effect on the pace of work. The difficulty of keeping up with the pace of the machines varied from job to job and from species to species.

The introduction of technology was an attempt to improve yields and produce specialized products due to market demands and resource shortages (Neis, 1991). Workers suggested that the company gradually brought new machinery into the plant to replace labour and lower production costs. Cutting machines were not new at the Catalina plant. However, after removing its filleting machines around 1970, management reintroduced them after the expansion in 1981 (Fishery Research Group, 1986:312-3).[23] These machines pushed through more fish, requiring displaced cutters to fill positions further down the

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[22]For example, even in the 1950s\60s when the Bonavista plant introduced machine skinners to replace some of the hand skinners, workers noticed an increase in the pace of work. This did not, however, result in layoffs. Rather, management moved these workers to other areas of the plant since additional workers were needed further down the assembly line to keep up with the amount of fish that the new machines were processing.

[23]The company, Fishery Products International, assured the union that workers would not be laid off.

line. Boning machines were also introduced at the Catalina plant after the plant expansion in 1980-1. The boning department was formed because of the extra work created by new filleting machines. Machine-cut cod went to boners to remove the v-bone and other bones and defects that the machine missed (Fishery Research Group, 1986:321).

Sometimes the introduction of new machinery did displace workers, especially those with less seniority. During the expansion years at the Catalina plant, displaced workers were simply moved to other areas of the plant (Fishery Research Group, 1986). As one woman claimed, "machinery (was) taking the place of people." Other new machines were introduced at the plant, but failed to work properly. Women voiced concerns about losing jobs if some of these machines had, in fact, worked. The introduction of machines sometimes meant that workers were reorganized, either to work on these machines, or to replace those hired to attend to the machines.

Workers reported that particular machines improved the quality of the final product, while others decreased the quality. Some said machines may have reduced the quality of the fish because of the way the machines handled the fish. They said machine processed cod had a softer texture than hand processed cod. In this way machinery sometimes reduced the quality of the meat. Women at the Catalina plant perceived the

"vacuum pack"[24] machine as improving the quality of products because it packed faster and provided a long shelf life.

Machines were a source of wastage. Some machines damaged and mangled fish. This, in turn, limited the products that could be produced from the fillets. Machine-damaged fish was usually used to produce block, an inferior product in terms of quality and revenue. The company introduced a nugget machine to the Catalina plant in 1984, which workers felt produced an inferior quality product when compared to hand cut nuggets and wasted a lot of fish. A new v-boning machine was also introduced but it was inefficient and wasteful in that it left too much meat on the bone that it removed from the fish. This machine was not used. Boners worked on machine cod and trimmers worked on hand cut cod; hand cutters effectively removed all of the bone and trimmers simply trimmed the fish.

For many workers, the introduction of some machines improved the working conditions at the plant. They meant less strenuous hand work. Machines could not always eliminate manual work because they were designed to operate on fish of particular sizes, usually average sized fish, and were unable to deal with other sizes. One worker said that the vacuum pack machine, introduced around 1990, could only handle small fish,

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[24]Products that are vacuum-packed are sealed in packages with much of the air removed.

smaller prime cuts, but, by then, the fish were smaller and workers could not get the larger cuts anyway. The introduction of a machine designed to process certain size of fish may indicate that management and owners were aware of what was happening ecologically. Three cod cutting machines introduced around 1981 were designed to take three different sizes of fish, but these machines, like many more at the plant, were unable to take fish if it was either smaller or larger than this. So very small or very large fish still had to be cut and processed by hand. According to one woman, the machine for processing small cod was kept particularly busy in the early 1990s. Women I spoke with linked the introduction of technologies to market demand. As changes in the raw material made it more difficult to meet orders of specialized products, they became aware of changes in the resource.

5.6 Tensions in Work Performance

Many of the workers at the Catalina plant held incentive paying jobs. Working under an incentive system meant that you had to cut, bone, and pack a certain amount of fish in a certain time period, while retaining quality workmanship. Workers set their pace accordingly and were paid according to how much they produced after they had met the minimum

requirements set by management. This was considered a 100 performance; 133 was top performance. In addition, any fish defects were tallied and taken into account when determining the requirements. If an individual's work was sloppy, then the worker responsible would lose so much bonus pay for that day. Each incentive paying job had separate counts and requirements according to fish quality, size, defects and so forth. Workers each had a number, which was placed in each pan of fish sent down the line. The weight, defects, and time taken to produce that pan were recorded to determine if the requirements were met and how much bonus pay, if any, a worker would receive (Fishery Research Group, 1986).

According to the workers, the incentive system took into account speed, the quality of the fish and the quality of the work. If the fish coming into the plant was good quality, then workers had to produce more to meet their minimum performance requirements. In addition, if the fish were small, more was needed to fill a pan, meaning not as many pans were required. However, management required more pans if the fish were large. The design of the incentive system also included which products were produced in the equation and time requirements were determined accordingly.

At first, the incentive system applied to all of the jobs at the Catalina plant. Even the foremen would get extra

pay according to how much their workers produced. However, management at the Catalina plant started to phase out incentive paid jobs in the mid-1980s. Whether or not you held an incentive paying job came to depend on the job itself and on when a worker commenced the particular job. This meant that workers performing the same job could earn substantially different incomes. A worker recently hired for one position might not receive incentive pay whereas the "older hands" who had worked at the job longer would. Workers such as cutters, trimmers, boners and packers still received bonus, whereas workers supplying these jobs with fish did not get bonus but were forced to maintain the same pace. Workers regarded the partial phasing out of the incentive system as unfair.

5.6.1 The Catalina Plant

It appears that the most recent incentive system at the Catalina plant was implemented at the same time the trawler fleet developed, although it may have been modified somewhat over time (Fishery Research Group, 1986:351). Over the years, workers found it increasingly difficult or easier, depending on their job, to get the bonuses they had received in the past. They related this to changes in the raw material. Boring jobs made them want to work faster because it passed the time,

but they also made it difficult for some workers to concentrate on doing their job. Interruptions to their work and difficulties meeting the minimums set by management made them aware of changes in the raw material. Many women stated that the incentive system influenced their pace of work but that they were concerned about the effects on the quality of the raw material, recognizing it as a food product. Some women noted that in the late 1980s and early 1990s the work pace slowed down at the Catalina plant and the nature of the work changed somewhat.

The incentive system and the new technology increased the pace of work and the amount of fish being processed but it affected jobs differently. The pace of work and requirements varied from job to job and with the species being processed.[25] Summer months were always slower than the winter months, due in part to the processing of such species as flounder, redfish and turbot. One woman mentioned that she did not have to pack as much flounder to get top performance. She did not remember the exact amount, probably because the plant did not process as much flounder as it did cod.

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[25]Many women thought in terms of getting top performance and could not remember what was needed to earn the minimum requirements. According to a packer, in order to get "tops" she had to pack 55 five-pound boxes of cod an hour.

Women noticed increasing amounts of smaller fish at the plant because this affected their work in the late 1980s and early 1990s. For some jobs, smaller fish and smaller catches meant it took longer to meet the requirements set by management. For example, smaller fish made a packer's work more arduous because smaller fish meant more cuts and portions to pack. However, smaller fish made it easier to make poundage for other workers, such as boners. Cutters also complained about reductions in the size and the texture as earning bonus pay became more difficult.

Many workers did not see a whole fish but rather a particular cut or portion. However, they noticed differences in the size and texture of these portions. A "pan"[26] of fish probably held 12 fillets in 1985, whereas it held 30 in 1990 and 1991. Women stated that large fish still came into the plant over the years but there were fewer of them. In the early 1980s, an average cod fillet was about four feet long. In the last couple of years, the fish were probably, on average, 12 inches long. Women generally agreed that fish about 18 inches long was perhaps the ideal size to work with in terms of degree of difficulty and meeting performance requirements.

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[26]Workers placed fish in 15 pound pans that were carried to various departments for further processing (Fishery Research Group, 1986).

Women voiced often contradictory concerns about the incentive system and its impacts on the quality of the fish. Women spoke, as consumers, about the quality of the food with which they worked and the way in which it was handled. According to many of the women with whom I spoke, workers sacrificed the quality of the fish in pursuit of the bonus pay. Trimmers and boners left blood spots on the fish, because removing them required more time. Because the incentive system necessitated speed, people did not spend any extra time with a piece of fish to make sure they cut, trimmed, or boned it to the best of their ability. According to many workers at the plant, the company no doubt prospered because of the incentive system in terms of getting more fish processed but the quality of its products declined.

Some workers felt that not as much fish would go through the plant without an incentive system, but that the quality of the fish might have improved.

> ... the way I look at something is you can rush through it and it won't be perfect or you can take your time and you know you've done your best and you got the best quality.

Given the opportunity to earn extra money, workers were encouraged to rush, sacrificing quality and creating wastage. This is not to deny workers' skills and quality workmanship.

Workers pointed out that they were also responsible for quality. "It's getting done faster but you still had to think about how you're packing." Some women insisted that despite problems with the incentive system, the plant produced top quality products. Spot quality checks were routinely done to check work performance, including both the speed and quality. When an incentive system is implemented, monitoring is inevitable. Workers' start and finish times were recorded. Each worker's poundage and work performance was tallied and recorded. If work performance dropped, workers might be reprimanded. In addition, the plant was routinely inspected for sanitation and quality. Many of the women agreed that these measures were substantial improvements and saw these as reasons why the high quality product was maintained, despite the incentive system.

> People looked at packing fish and ... [they] said anyone could do that but really you got to know what you're doing you know because I mean you're handling food and you got to have good quality fish, and you got to make sure your packaging is good.

Some of these contradictions might be explained in two ways. First, women often took pride in their work and did not wish to imply they performed poorly. Second, given the scarcity of work in the area since the declaration of the moratorium,

these women may not wish to portray the company or its workers in a negative light for fear of losing their jobs or not being hired in the future.

Some Catalina workers voiced concerns about the incentive system and wastage. There was disagreement about the extent of individual wastage at the plant. The incentive system no doubt generated some waste. Cutters and boners left more meat on the bones they removed because they rushed to get the work done. Some women considered it waste if good quality meat went into products such as block when workers could have gotten good cuts from it. If the cod were small, workers would not waste time trying to cut a high quality portion, such as a mini cut. Rather workers used fish unnecessarily for block because it was quicker. Packers sometimes packed fish into block because it was the least time consuming pack, despite the fact that better quality packs could have been produced. Workers did not always take the time to remove all defects. As a result, fish was sometimes unnecessarily used for block. The incentive system encouraged the production of particular products of which management wanted less, such as block. Fish accidently dropped on the floor was left to flow down the drain. The odd worker dumped or dropped fish in the drain if it was particularly difficult and time consuming to work with, especially if the fish was soft. One worker saw this first

hand when she stayed behind after night shift to clean up the plant. Some workers in both the Catalina and Bonavista plants said that workers were monitored and reprimanded if they did not try to use as much of the fillet as possible. For example, if boners left too much meat on the bone, they would lose so much of their bonus pay for that day. Managers occasionally closed lines of workers because draggers did not bring in enough fish to keep the employees working.

5.6.2 Changes in work without incentive: The Bonavista plant

Management at the Bonavista fish plant did not implement an incentive system. However workers still had to reach the minimum requirements set by management, "[we] had to do our day's work," as one woman put it. Management recorded individual work performance.[27] If a worker at the Bonavista plant did not consistently reach his or her one hundred performance, he or she would be notified by the supervisor.

According to the women who worked at the Bonavista fish plant, workers did not spread out or slow down work because managerial monitoring made this impossible. When there was only one shift working, workers tried to get the work done as

[27] In the 1950s and 1960s, management ranked individual workers as top, second, third and so on in terms of work performance. This encouraged competition amongst the workers.

quickly as possible because they remained at the plant until the fish was processed. One woman commented, however, that work had gotten slower in the last few years before the moratorium because less fish was coming into the plant. She hinted that workers tried to slow down the pace to get a few extra hours employment. Women at the Bonavista fish plant noticed the size of the cod fish entering the plant had gotten smaller the last few years before the moratorium: "The last couple of years we were working that's all we seen was small fish from the traps." The size of the fish affected some workers' ability to meet the minimum requirements. Some claimed that larger fish were harder to handle, for example, harder to bone. In some ways then, work got easier in the late 1980s and early 1990s with an increase in the number of smaller fish processed at the plant.

5.7 Changes in other species as indicators of ecological change

Both the Catalina and Bonavista fish plants processed other species of groundfish besides cod, such as catfish, turbot and flounder. Processing of these species could have masked or balanced the impacts on employment of a decline in cod. Catalina workers observed increased attention to

processing other species, such as flounder and turbot, at the same time as they noticed changes in the size and amount of cod entering their plants. One woman who worked at the Bonavista fish plant commented that in the late 1980s the longliners brought in more and larger turbot. It appears that work on these species also declined, however, in the late 1980s and early 1990s perhaps due to a shift in harvesting effort and related decline in these species as well. Trawlers and boats brought in less flounder and turbot than they had before the 1980s.

Usually only the most senior workers worked in the summer months because the Catalina plant processed less of these other species and produced a narrower range of products. Nevertheless, workers noticed that summer work got even slower in the late 1980s and early 1990s. According to one woman plant worker, for the first time in all her years at the plant she was laid off in the summer months in 1990 and 1991 because the other species were scarce and thus there was not enough work. Because of changes in the pace of work and the amount of fish entering the plant, the workers recognized tensions between market demand and the health of the resource.

In general it seems that most of the species that entered the Catalina plant decreased in size over the years. Flounder processed in the early 1990s were smaller than in

previous years. Packers noticed this because it meant more pieces to pack in order to meet managerial performance requirements. The average turbot that the plant processed was once so large that one had to hold it with two hands. It gradually decreased in size to about five or six inches in 1992. All of these changes meant less work during the summer months. The plant did, however, introduce some new species in the couple of years before it closed down, for example monk fish. This did not increase, however, the amount of work to any considerable degree.

5.8 Mismatch between products and raw material\marketability

The Catalina and Bonavista plants produced a variety of products over the years such as nuggets, block, and fillets. Women linked changes in products largely to market demand. For example, a woman who worked in the Bonavista fish plant in the 1950s and 1960s stated that the company produced mostly cod block for fish sticks and fish cakes to meet the market demand in the United States. When the markets and prices changed, so did the products. The company required less block, but more cuts and portions. The company filled orders which determined, in part, which products the workers had to produce each day. These products were difficult to produce after changes

occurred in the raw material during the 1980s and 1990s. FPI wanted less block over the years because it generated less profit and it wanted more prime cuts and mini-cuts instead. Production of new products such as nuggets and strips was also determined, at least in part, by market demand. In addition, FPI wanted to look for ways to reduce wastage at the processing level in response to declines in raw material. Different products demanded different grades of fish quality. In the later years, when the fish that entered the plant were small and softer, it became increasingly difficult to generate particular products that demanded high quality fillet or a large size fish. However, it was easier for workers to get their incentive by producing block. So while the company wanted less block over the years its formal policies did not encourage workers to produce less. An increase in smaller fish and fish with a softer texture encouraged workers to produce block when working with an incentive system. In this way there was a mismatch between the incentive system, raw material, production, and market demand.

Women at the plant recognized the mismatch between market demand and the products produced. Such mismatches can be used as indicators of ecological and economic changes and reveal how capitalist industries respond to these changes. Women often used size and texture as indicators of decreased

quality over the years. Often workers were unable to produce the products that the company wanted because of the increase in lesser quality fish that went through the plant in the 1980s and 1990s. Prime cuts were scarcer over the years because the fish from the draggers were not the high quality fish needed for such packs. A packer explained that soft textured fish was used for cod block and better quality fish was used for specific products such as five pound packs. However, she saw fewer five pound packs go through the plant in the last few years before the declaration of the moratorium in 1992 and connects this to a decrease in the quality of raw material. Most of the machines required high quality meat, with a firm texture. Soft textured fish was unable to go through the machines. A decrease in the quality of incoming fish meant that less fish went through the machines, and thus, less of these products were produced. Women attributed the decrease in the quality of fish texture to both changes in the raw material itself and to machine processing.

Women supplied a variety of reasons to explain the soft texture of fish: texture was thought to be linked to the size of the fish, as well to the length of time fish spent on the trawlers and in smaller boats, especially with increased effort time over the years, and to using suction to remove the fish from trawlers. Boxing fish on trawlers was introduced in

the early 1970s in order to preserve texture (Fishery Research Group, 1986).[28] Softer texture was also connected with trucking fish either from other fish processing plants that had more fish than they could handle or from their own trawlers that had landed their catch elsewhere due to ice conditions in the bay. Both the inshore and offshore plant workers noticed this with trucked fish. Soft fish was difficult to do anything with by hand or by machine. Women who worked in the inshore fish plant linked the texture of the fish to the weather and the time of the year. Fish was more likely to be soft in hot weather and in mild seasons.

Size of fish also limited products at the Catalina plant. Instead of producing a prime cut which was five or six inches in length, workers began producing mini-cuts two and a half inches long. Usually five or six people were employed cutting prime cuts, but by the early 1990s only two or three people were doing the job because of a shortage of large fish. According to women workers, small fish ended up in block unnecessarily because people did not take the extra time and attention required when working with smaller fish to get particular cuts. It was harder to get a mini cut or prime cut

[28] However, in the 1970s boxing did not become a regular feature at processing plants. Boxing was reintroduced in the mid-1980s (Fishery Research Group, 1986).

from smaller fish. On the other hand, very large fish were equally difficult to work with, and time consuming.

New machines and technology at the Catalina plant, such as quick freeze technology, vacuum pack machines, a cheek machine (introduced in the mid-1980s), and machines for packaging tails, allowed for the production of new products, new cuts and different sizes of cuts. In the last 4 or 5 years before the plant closed, it appears that FPI began processing fish parts, such as cheeks, tongues and cod heads, previously discarded or used for fish meal. Workers tried to save more fish and fish parts that would have been considered rejects a couple of years earlier in order to get more hours. One woman noticed this because she found this work particularly tiring. She also noticed a change in terms of weekly pay. However, this production was small and did very little in terms of creating work. Was this interest in these products because of concern over wasting food, market demand, or a way to compensate for lost profit due to changes in the raw material, stock decline and quota cuts? These changes may indicate that the company was trying to offset the profit lost due to a decrease in the numbers and quality of fish by producing parts once used for fish meal. Women generally viewed the production of these products as an improvement because they decreased wastage from the cod fish, as edible parts were now sold as

food instead of fertilizer or simply dumped. Bones, spoiled fish, and whatever was not used for block went into fish meal. Some of the women I spoke with who worked at the Bonavista and Catalina plants did not consider it a waste when fish went into fish meal even if it was edible. At least it was being used for fertilizer.

5.9 The Quality of raw material

Just as changes in gear and in the resource may have affected the work of making salt fish including the fish available for eating and its quality, similarly these changed the work in fish processing plants. The inshore plant workers did not notice changes in texture. In the years before the moratorium, rather, they related texture, in terms of the softness or stiffness of the fish to gear type, time of year and the weather. Inshore plant workers were more aware of changes in gear and the effects it had on the quality of fish than offshore plant workers perhaps because there was more diverse gear used in the inshore fishery. However, the women, like fishers (Hutchings, Neis and Ripley, 1995; Neis, Felt, Haedrich, Hutchings and Schneider, 1995), did not always agree on which gear type more adversely affected the texture of the fish. Such contradictory findings may be related to spousal

relations, gear chosen by family members or simply not paying attention to the details of the texture of the fish.

Women blamed both trap gear and gill nets for making fish softer and bruising the fish. Gill nets left fish tangled and dead and trap fish were sometimes left for days. According to the women, the longer fish were left, the worse the quality. According to women who worked in the inshore plant, fish caught in the fall as opposed to summer was better quality because the weather was cooler and usually fall fish was caught using handline or trawls. Gear used and the time of year\weather were the reasons offered to explain this difference. With the introduction of longliners in the 1950s and 1960s (Sinclair, 1987), the composition of the catches changed as more, larger fish were available. This knowledge closely resembles the seasonal information gathered from the women who made fish. One inshore plant worker noticed that the size of fish the workers processed was smaller in later years but that fish had always been smaller in traps. There was a general consensus that fish got smaller over the years, no matter what gear was used.

During the 1980s and early 1990s, fish was trucked in from other fishing communities and from other plants, especially when those plants had more fish than their workers could handle, if the Catalina or Bonavista plants did not have

enough fish from local boats for full production. Fish had always been trucked into the Catalina plant when its draggers had to port elsewhere due to ice conditions. The Bonavista and Catalina plants also trucked fish out to other plants when their boats supplied more than the plant and workers could handle.

In general, trucked fish was softer in texture, probably due to delays in processing and the travel. The texture of trucked fish made plant work difficult because the fish fell apart. The management took the texture of trucked fish into account when designing the performance requirements. The minimum requirements were not set as high when workers processed trucked fish. In addition, the texture and quality of the fish trucked also restricted which products could be processed. According to the women with whom I spoke, this fish usually went into block which was considered to be a low quality product.

The women I spoke with said trucking in fish increased in both the Catalina and the Bonavista plants in the 1980s and 1990s indicating ecological changes. Interestingly, a woman who worked in the Bonavista fish plant in the 1950s and 1960s suggested that very little trucking, if any, occurred in those years. According to her, there was less technology at the plant at that time and thus the fish did not go through the

plant as quickly as in later years. The local fishers sustained the plant and whatever was not processed was salted. However, another worker remarked that the plant's own boats harvested more fish than it could handle in the 1980s and so management trucked the fish elsewhere. This may indicate an increase in fishing effort over time and increased fishing technology in the 1980s. It may also indicate the effects of increased production of crab at the Bonavista plant. In the years immediately before the moratorium, fish was trucked in more often because its draggers did not bring in enough fish to keep the plant operating with two shifts working. Workers linked an increase in delays in their work while they waited for trucks to deliver fish to changes in the health of the cod stocks and to quota cuts. Trucking fish in could have masked a decline in catch rates of company trawlers in Catalina.

Some Catalina workers noticed that sometimes the quality of the incoming fish varied according to which dragger brought in the fish. Some of the workers who had experience working in inshore plants, or were otherwise involved in the inshore fishery as wives of fishers, held additional fisheries knowledge in terms of gear and its effects on fish. Women at the Catalina plant could see distinct differences in fish from year to year in the 1980s and 1990s and between inshore and offshore fish. The texture of inshore fish was described as

rubbery, stiff, and firm. One woman said that inshore fish had a glassy appearance, as if you could see through it. Women often described the texture in terms of how it affected their work. For example, a packer told me that it was harder to roll inshore fish for particular packs because of its stiff texture. A worker had to take more time when working with inshore fish. Boners found it more laborious to get the knife through an inshore fish, slowing down their work. Other workers stated that inshore fish was harder to work with because it was smaller, while others preferred working with smaller fish, depending on their job. Offshore fish was generally softer than inshore fish. This may be because offshore fish was removed by suction. It also remained on the boats for many days before it reached the plants. Sometimes dragger fish was too big to handle. Offshore fish was often frozen when it came into the plant, which made hand work difficult. Some women considered inshore fish to be better quality fish, partly because of the texture, but one woman whose father was a retired trawlerman stated that offshore fish was better quality fish. Since workers did not want to suggest that they produced poor quality fish, many workers added that dragger fish was "still good fish." In general, unlike those in Bonavista, women who worked in the Catalina plant did not notice seasonal changes in the fish.

5.10 Wastage at the plant

Because of women's place inside the plant many were uncertain if fish was discarded at any time before processing, but many suspected as much:

> At that time nobody knew the difference...they thought they were too small to process ... a lot of people are blaming everything on the draggers and the different companies and that but there was a lot of wastage going on in the inshore industry too. A lot of small fish were dumped.

Some women believe the plant owners dumped fish or fish parts before the introduction of the fish meal plant. Women voiced concerns about dumping fish and spoilage on trawlers due to longer fishing times. According to some women plant workers, more fish spoiled on trawlers and was rejected in the late 1980s and early 1990s due to longer harvesting efforts. This fish went into the fish meal plant. If the draggers brought in more fish than the plant could handle it may have been dumped. Draggers also needed adequate supplies of ice for fish on draggers, which they often lacked, thus causing fish spoilage and wastage.

Bonavista plant workers suggested that in the summer, fishers or companies may have dumped fish because it soured in

the heat, especially if left in the trap for a couple of days when fishers could not haul their traps because wind and weather conditions were unsuitable. Sour fish was probably dumped into fish meal. Some women doubted that fish was dumped often because of the profit it generated. As one woman put it: "they'd knit it if they could," meaning that fish was such a valued commodity for the fish plant owners, as well as for the fishers and plant workers, that none would be unnecessarily wasted. Other women suggested that buyers largely determined the definition of fish quality in terms of how fish looked. Fish that was edible, but did not look particularly good, was used for block.

Women suggested that in the early years of operation the fish plants produced a lot of block and that fish parts unnecessarily went into block. By this they mean that these parts are considered high quality cuts and portions in today's market. In general, workers perceived less wastage at the plant over the years, especially with the increase in products processed at the plant and stricter control measures. The plant processed more parts and most everything in later years as the fish got smaller and scarcer. Women also added that FPI maintained standards in terms of quality and food products because it served international markets.

5.11 Women's local ecological knowledge

Women's knowledge is derived from their labour process. New technologies and managerial strategies introduced in the 1970s and 1980s had an impact on their work, the quality of the food produced and wastage. They also indicated to the women various changes in the resource itself. In times of increasing resource scarcity, fish processing workers noticed changes in the raw material as they produced changes in their work. There was a general consensus among those interviewed that the amount and the size of the cod decreased and the texture of the fish got softer in both plants, especially in the mid 1980s and the early 1990s. Workers related changes in technology, ability to make bonus, and changes in particular products processed to changes in raw material. Women pointed to unsustainable practices at the processing level, such as wasting fish to get bonus pay, and to mismatches between raw material and market demand, and raw material and technologies and managerial strategies. Causes and trends are difficult to discern because of the multitude of factors that mediate their knowledge.

Women were not actively looking for changes in the raw material and often they were too busy to be concerned with anything other than meeting managerial requirements. However,

changes in the raw material and the amount of fish that entered the plant became obvious when they affected their work and pay. Some women stated that the quality of the fish decreased over time because the fish were smaller, thinner and softer. They defined quality in terms of size and texture. As one woman put it, there was "not much to a fillet." One woman said that she saw fish come into the plant with more bruises, black pecks, and worms over the years.

Workers noticed increased harvesting effort and longer harvesting times for fishers. Some workers linked increased lay offs to a decrease in the amount of fish coming into the plant. Trawlers that once brought in full loads were coming in with hardly anything in the late 1980s and early 1990s. Trawlers usually stayed at sea for seven to ten days. This later increased to twelve and fourteen days.

> ... the first year I went there, when you went you could see fish piled up everywhere right, but then the last couple of years you worked you were waiting around for fish and it slowed right down.

Workers became aware of changes in the size and texture of fish in a number of ways. First, fish were not always able to go through certain machines like they had in the past. Machines required a firm texture and a certain size fish. Second, workers were not able to produce particular

specialized products because of the poor quality and small size of incoming fish. This indicated to the women changes in the resource itself but also increased fishing times on the part of the fishers or the trawlers. Women linked increased fishing time to fish with softer textures. Third, workers were sometimes unable to meet performance requirements because of the size or texture of the fish. Fourth, the pace of work slowed down substantially in the late 1980s and early 1990s. Fifth, the production of new products, and the introduction of new machines to produce new products, indicated to the workers an increased concern on the part of the company for utilizing all of the fish, even parts previously discarded. This suggested that something was happening both economically and ecologically. Finally, trucking in fish increased in the last few years before the moratorium. This suggested that local fishers or company trawlers were unable to catch their quotas.

Women who worked in the inshore plant linked changes in the texture of fish to weather, gear and time of year. These workers knew more about gear types, and their impact on quality, than offshore workers. This may be due to the fact that the inshore fishery used more diverse gear, but it may also be due to the fact that women inshore plant workers were more likely to be married to a fisher. Their knowledge was similar to that of the salt fish makers. In addition, women

who were related to trawlermen were more inclined to defend the quality of offshore fish.

It seems that the offshore plant workers did not feel the effects of resource shortages as early as inshore plant workers because they depended on a year-round supply of fish. The inshore plant was especially vulnerable to fluctuations in stocks because it depended on a seasonal supply of fish from inshore fishers. However, women working in both plants experienced changes in their hours of work. Women's local knowledge not only informs us about the changes in raw material and their work over the years, but also about the quality of food products in relation to ecological change and capitalism's response to such. They knew ways in which different machines and the incentive system affected the quality of the products and encouraged the wastage of fish. In this way, women's local ecological knowledge links the natural world to the social and economic world.

These themes reflect some of the findings on fishers' ecological knowledge. Like the women I spoke with, fishers noticed decreases in the amount and size of fish over the years. Neis (1992) found that in the 1980s fishers increased fishing effort by purchasing more gear and experienced longer fishing days and increased competition for berths because fish was scarcer. In addition, they noticed that the size of fish

was decreasing because they had to catch more fish to make poundage (Neis, 1992:163-4). An important difference between fishers' and plant workers' ecological knowledge is that plant workers have less opportunity than fishers to test their knowledge because of the constraints of managerial strategies and surveillance within the plant and lack of ownership. This may explain why women are sometimes uncertain about their knowledge.

CHAPTER SIX: THE LOCAL ECOLOGICAL KNOWLEDGE OF WOMEN CRAB PLANT WORKERS

6.1 Introduction

Although the crab fishery does not appear to be in immediate danger of collapse, shifts in harvesting and processing effort may change this in the future (Neis, Felt, Haedrich, Hutchings and Schneider, 1995). Below I explore some of the potential dangers, as articulated by women, to the sustainability of this resource. I begin with a description of the crab processing area in the Bonavista plant and workers' performance requirements. This is followed by a discussion of women's work hours at the plant, technologies and raw material, and the mismatch between products produced at the plant and changes at work. Next, I describe women's knowledge concerning the link between the quality and the harvesting location of crab, yearly and seasonal changes in crab, and wastage at the plant. I conclude with a description of women's local ecological knowledge.

6.2 Description of crab processing area

The crab plant was added to the Bonavista plant in 1969, years after the fish plant commenced operations. The plant, unionized with FFAW, employed up to 200 workers. The fish processing area closed in 1992 and has since been transformed into a crab area. In the original crab plant, the crab went through a longer process that entailed producing claws and meat. In more recent years, more crab is semi-processed into shell-on sections.

Before the conversion of the fish processing area, from time to time, the crab plant workers would work in the fish plant if there was an influx of fish and if there was not enough crab to keep them employed. Management could temporarily move crab workers, who were also trained to process fish, to the fish plant and vice versa. Usually this transfer lasted a day or so but sometimes crab workers stayed in the fish plant for a few months. Most of the crab workers preferred and felt more comfortable working with crab as opposed to fish. The crab plant employed primarily women. Men filled positions on discharge and freezing jobs. Men were also in charge of the cookers and worked as butchers. Since 1992, some of the Bonavista fish processing workers have been given

work in crab processing. Some Catalina fish plant workers have also acquired work in crab processing at Bonavista.

6.3 Performance

Management did not implement an incentive system at either the crab or the fish plant in Bonavista. But similar to fish plant workers, crab plant workers had to meet the performance requirements set by management. Each worker had to process so many pounds of crab; otherwise they were reprimanded, which usually entailed an oral warning. In addition, the quality of work was monitored. When the crab plant first opened, each individual worker's performance was monitored and recorded in terms of poundage. Management displayed the performance "scores" on a bulletin board for all of the workers to see.

6.4 Changes in women's hours of work

In the 1970s work started at the plant in March or April, when the ice conditions were clear and fishers could harvest crab, and finished in October or November. In later years, the crab season was split. It started in May or June and ended in July or August, when the crab changed its shell,

and started again in September for a couple more weeks. Workers would normally get anywhere from 15 to 26 UI stamps, depending on seniority. Access to unemployment insurance was usually not a problem because there was plenty of work and plenty of crab.

According to the workers, the length of the operating season at the crab plant decreased in recent years and most have had a difficult time working enough weeks to qualify for UI. Qualifying has been especially hard since the implementation of new UI regulations (Rowe, 1991). In 1995, the summer I interviewed these women, most did not qualify for unemployment insurance and there were fewer calls to work. Many workers had hopes that they would get some additional work if new types of crab were introduced to the plant for processing.

> I know you shouldn't be worrying about getting your stamps, but when you live in a small community like this and the fishery is only seasonal, you get in and you try to get what you can.... It's an industry where our workers should be getting at least 15 weeks, but we're down to 10 or 12.

When the Bonavista crab plant first opened for operation, there was one shift that worked long hours. Over the years management hired more workers, brought in more machinery, and processed more crab. The plant management

introduced the night shift in the crab plant in the late 1980s.[29]

> Like I said, there five years ago I suppose now, we didn't know what it was to have shifts, we done it all, all day long and if they asked us to come back, probably after supper, we'd be there probably until ten or half past ten in the night. But it's not that way no more. When you gets your 8 hours now, out the door you goes, and some days you don't get your eight hours, and then another shift takes it over because they got to leave this much crab for the other shift to get the same amount of work as you got, right? That's the way they goes now.

One shift was filled with the most senior crab workers; the other with less senior workers. Shifts rotated, working a week of days, then nights. At the end of the season, when there was not enough crab to keep two shifts working, management would cut back to one shift, filled with the most senior workers.

It seems that hours were always uncertain at the crab plant. However, in the early and later years this uncertainty was particularly great. Crab processing is intense work because crab must be processed as it enters the plant; it must be alive when cooked. Workers usually work 5 days a week. However, when the plant was in full swing with an influx of crab, women could work 7 days a week. Obviously, the number of days of work per week varied with the amount of crab that came into the plant. Workers began working on Sunday in the last 5

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[29] At this time, there were four shifts at the Bonavista plant, two for the crab processing area and two for the fish processing area.

or 6 years because of the increased amount of crab coming into the plant. The average day lasted 8 or 9 hours, although there were times when workers might get 4 or 6 hours a day.[10]

The plant processed more crab at a quicker pace in recent years and more people were hired to do this work. While more workers may have been hired and the senior workers may have worked up to seven days a week, the season lasted for a shorter period of time. Workers suggested a variety of reasons for the lack of work at the plant in recent years. Women linked this primarily to changes in processing and the introduction of automation and new technologies:

> ... plenty of crab but what I mean to say with the way it's being processed you got to have a lot of crab to be able to give you your time for the workers, you know.

6.5 Technology and processing crab

When the crab plant first opened, it appears that it was an experimental project, where management and workers learned as they went along. Fishers brought in less crab in those early years and processing was very time consuming because

[10] Management at the Bonavista plant, like the Catalina plant, did not call in workers for less than four hours because, according to their contract, if a worker was called in she received pay for at least four hours. This was still the case at the time I spoke with these women.

most of the work was done by hand and because of the products they produced.

In the original crab plant, they process the crab meat as they did in the past, except hand work has been nearly completely replaced by machinery. The legs are removed from the crab. The crab is cooked live in the same cookers. The crab legs are separated from the bodies and cut into sections. The butcher knife that used to be used to chop the crab has been replaced with saws. Rollers, like mini wringers from a wringer washer, were brought in during the first year of operation to remove meat from the tips. Later they began removing the meat from the legs with rollers as well. The roller catches a bit of exposed meat and hauls it out. Later management introduced another method to remove the meat from the tips by dumping them into a large machine which squeezed out the meat.

Eventually, meat was removed from the shell using a drum and by washing it with water. According to one woman this last process changed the quality of the crab. Excessive washing dampened the smell of the crab. In the past, barrels with holes were used to shake out the meat. The shell remained inside the barrel and the meat came out. Today the bodies go through a "system", a mince machine of sorts, to separate the shell from the meat using a screen. The crab is washed, with

water constantly running through the meat. Women worked under black light picking out any shell fragments left in the meat. When the plant first opened, there were approximately 25 to 30 women working under the black light. At present there are not nearly as many because the meat is cleaner, i.e. there are fewer shell fragments left in the meat by the time it goes through the machinery and the entire process at the plant. In that way, the machinery has improved the quality of the meat and decreased the amount of meat wasted. It has also eliminated positions. Then the meat is weighed, brined with a salt mixture to preserve it, and packed in boxes.

In 1969, crab meat was shaken out of the bodies and legs by hand.

> ... like first when we started ... stuff would be all hand work, like knocking crab out with your hand and stuff like that. Then it advanced, as time went on, in the future like, ... more machinery came in and then it took over a lot of things doing with crab, so you weren't using your hands so much as you were before and machinery was taking over a little bit right.

Machines made some of the work at the plant easier for the workers. Hand work, shaking and knocking the crab out of the shell was strenuous work and the women injured their hands. Despite the fact they wore gloves, they cut and bruised their hands:

> ...like you know 'cause it was slavery in a sense what we did before. I mean, everything was done in hands. I mean you come home and people have their hands torn up trying to get the crab out of the ... bodies and stuff right, the meat out of the crab. But with the machinery, I mean no jobs were lost, but I mean still people had to run those machines.

However, machinery accelerated the pace of work and allowed more crab to go through the plant. It enabled the company to increase productivity. Most women, but not all, agreed that the machines set a faster pace for the workers. Sometimes crab piled up in one area of the plant so workers froze it after it was cooked and put it aside to process later. Increased machinery and equipment at the crab plant meant that more workers were needed to tend machines and to keep up with the increased amount of crab that the plant was able to produce. The new machinery is sometimes dangerous. What effect does machinery have on workers' ability to make a living? Are these technologies encouraging and enabling unsustainable practices?

The company has introduced a new sanitation program at the plant in recent years. Workers are obliged to wear a specific dress and cap and the company has started to clean the workers' uniforms in the plant. FPI introduced stricter sanitation regulations in terms of the cleanliness of uniforms and the work environment. According to one woman, these changes were the result of pressure from major buyers, such as

the Japanese. The women I spoke with generally felt that this represented an improvement in both the working environment and the quality of the food product. In addition, it reduced the work for the employees who had previously carried their uniforms home to clean. However, one woman questioned the level of sanitation of the machines. According to her, the machines were not cleaned as often as they should have been. Workers were usually busy and did not get an opportunity to clean them during the day. She believed that, as a result, the crab meat was not as high quality or as clean as it was when the work was done by hand.

6.6 The link between products and hours of work

The crab plant now produces mostly crab sections instead of meat products in the fish processing area. This process is quicker and more crab is processed this way. Workers relate a decrease in work in recent years to harvesting quotas[11], machinery and producing sections.

Today, there is a big demand for sections, especially from the Japanese market. This recent market demand has altered the labour experience for workers. Producing sections

[11] Crab quotas were introduced in 1985. However, quotas have increased since 1992-3 (Neis, Felt, Haedrich, Hutchings and Schneider, 1995).

simply entails bringing the crab into the plant, butchering it in half, cooking it, cleaning it, cutting it and packing it in boxes. Producing sections has substantially increased the amount of crab that is able to go through the plant in a day. They are both easier to produce and consume substantially less time than removing the meat from the shell. For example, one woman remembers when 200 boxes of crab was a day's work at the plant. Today, with two shifts working, the plant workers could potentially process up to 4000 boxes of crab a day. Workers attribute the fact that there is less work at the plant to the second shift, but also to the process the crab goes through. More crab is entering the plant now but it goes through the plant quicker:

> ... one time, in the crab plant, you would go in that crab plant and you wouldn't know what it was to have a bit of crab with a shell on it. Every bit of the meat had to come out of the shell. But now ... takes it directly right from the water and just washes 'em in the plant and they sends them right on. So this is why the work is cut.
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> ... by being able to do it in sections the plants are able to take more crab. If we were only doing the finished product, well the most we could handle would be about 1600 boxes, 2000 boxes a day you know, but now you're almost 3000 boxes a day.

In this way, the quotas caught are processed more quickly when producing sections. This procedure, combined with

the quickened pace due to technology, has reduced the work time at the plant:

> [C]rab processing has been automated in many plants because of the combined impact of lower prices due to competition from surimi and more limited supplies of suitable raw material forced companies to process larger volumes more quickly. Companies are now competing aggressively for crab quotas and through a variety of mechanisms, including increasing their ownership in crab vessels, are attempting to keep their technology working by concentrating crab processing in fewer plants (Rowe, 1991:21).

In addition, fewer workers are needed to produce sections than to produce the finished product. There seems to be a mismatch between markets, processing and the sustainability of people in fishing communities.

The crab coming into the plant is graded and any crab that is not suitable for sections is considered a reject and designated to be processed as meat product. Combo packs and layered meat and legs are sold to restaurants. The best quality crab goes into sections and is sold. The workers say that the shell of crab suitable for sections can not have a dark colour or any other visible defect. If the crab body is dark coloured, it goes through the full process of removing the shell to be sold as the final product. "... like it's not very appetizing ... a black section on your plate as opposed to a nice bright orange one."

6.7 Harvesting location of crab and quality

Local fishers harvested crab and sold it to the Bonavista crab plant. The plant also received crab trucked in from other communities, such as Twillingate and St. Anthony. According to the workers, crab was trucked in for a number of reasons. First, some fishers preferred to deal with larger companies. Second, it kept the plant running when the Bonavista fishers had caught their quotas. Third, fishers in communities where there was no crab plant or the plant was closed sold their crab to the Bonavista plant. In addition, sometimes another crab plant would receive more crab than it could handle and truck the excess crab elsewhere. The Bonavista plant owners also trucked out crab to other plants, such as the one in Trouty, when they received more crab than the plant workers could manage.

Crab plant workers identified the harvesting location of the crab as a major indicator of quality, which in turn determined whether or not the crab would be sold as sections or finished product. Apparently this fluctuated from year to year, as one year the crab harvested in the Bonavista Bay area could be high quality and in Trinity Bay that year the crab might be poorer quality; but the next year the crab harvested in Bonavista Bay might be consistently poorer quality and that

from Trinity Bay might be consistently higher. The size of the crab changed from year to year and varied with the location in which it was harvested. "Bad" quality crab generally did not mean that the crab could not be processed, but that it was not suitable for sections and that it would go through the longer process to produce the meat products. In addition, whether or not the crab was "clean" in terms of being covered with leach eggs or black specks also depended on where the crab was harvested in a particular year. Women also noticed that particular boats consistently brought in the best quality crab.

Women noticed variations in the texture of crab meat depending on the size of the crab and where it was harvested in a particular year. Large adult crab contained a lot of meat and had thick leg meat which was considered good quality. The company preferred crab with lots of meat and thick legs in order to get certain packs which sold for higher prices. Poor quality crab was crab that was full of water, usually a sign the crab was shedding its shell and developing a new one. Because of stricter quality control at the crab plant, introduced about 10 years ago, crab does not enter the plant if it has a soft shell or if it does not meet a minimum size requirement. The best quality crab was used for sections.

These women seem to have adopted the company's definitions of quality.

6.8 Yearly and seasonal changes in the crab

When the plant first opened, fishers and plant managers did not understand the seasonal changes in the crab. In later years the harvesting season was split to accommodate these changes. Thus, in July or August, the crab shell becomes softer and the bodies of the crab are watery instead of being filled with meat. When the plant started to get mostly soft shelled crab the workers were laid off each year until September, when the crab had developed a new hard shell. Some workers said that it was difficult to notice certain changes or particularities with the crab because of the division of labour at the plant. However, many women noticed changes in the size and colour of the crab and the amount processed.

The size of the crab changed over the years. According to the women with whom I spoke, when the plant first opened for operation in 1969, the crab were huge. The legs measured five or six inches in length. Over the years workers noticed a decrease in the length and thickness of the legs:

> You don't get the same from them like you did before, like the legs you get before, they were

> thick crab. But I think they're smaller crab now than what they were before.

In addition, the colour of the crab has also changed in recent years. Leg meat used to be a bright, rich red. In recent years the colour is a pale pink. Workers who have worked at the plant for many years believe there is more crab being processed at the plant than in the early years. This may be due to an increase in quotas and in fishers who have licenses to harvest crab. This has been encouraged by the closure of the groundfishery.

6.9 Wastage at the crab plant

Woman at the crab plant suggested that very little was wasted, especially in recent years. Crab had to be a certain size to enter the plant and women were uncertain about what happened to crab that did not meet these requirements. However, at first, when the crab plant opened, there were few restrictions concerning harvesting and processing crab. Quota restrictions came into effect in the 1980s. Women who worked at the crab plant when it first opened reported that a lot of crab was dumped. In the early years fishers harvested watery crab with soft shells that could not be processed. Other women suggested that when the crab work was done by hand there was

wastage because the workers could not get all of the meat out of the shell. This may have been one reason the drum and rollers were introduced at the plant. If the crab died before it was cooked it was dumped. Crab processed during the summer months, in hot weather, often died before it was cooked and had to be dumped.

6.10 Women's ecological knowledge

Crab plant workers depend on the successful management of the crab fishery for their livelihood. Women voiced a number of concerns about the health of the crab stocks. These women have indicated that they are aware of the varying quality of crab depending on where and when it has been harvested. They have noticed a decrease in the size and quality of crab in recent years, as well as changes in its colour. This knowledge might indicate some ecological changes that should be considered in fisheries management policies. According to Neis and Felt, fishers in the Bonavista region suggest that the snow crab has increased its spatial distribution, as well as its numbers. Fishers believe this is because there are no longer any larger, older groundfish around to consume the smaller female snow crab (1995:7). All

of these concerns indicate ecological changes, some of which may be a response to the collapse of the ground fishery.

Women also expressed concerns about the production of crab, especially as it relates to less work at the plant. While women felt that machines decreased the wastage of crab by effectively removing more meat than by hand, they blamed new technology and changes in processing for decreasing the available hours of work and making it more difficult to qualify for UI. These women linked the importance of processing and technology to the livelihoods and survival of fishing communities and their households. Crab harvesting and processing must work in the lives of people who depend on the resource.

I believe these concerns warrant further investigation before a situation develops with the crab similar to that associated with cod resources. Workers are experiencing uncertainties at work, increased difficulty qualifying for UI, and changes in their hours which resemble those experienced by fish plant workers.

CHAPTER SEVEN: NUTRITION

7.1 The Importance of Fish as a Source of Food

Families that depended on the salt fishery ate some type of fish, usually cod or caplin, nearly every day, sometimes every meal of the day. Women I spoke with said that in the fishing season, their families ate fresh fish every day and women would sometimes dry some fish for their husband's lunches. They said fish was relatively easy to prepare for meals while they worked on the flakes. Some of the fish that was caught late in the fall of the year was salt dried for winter family meals. This was high quality fish because it was caught using hook and line or trawl and because the weather conditions were especially conducive for drying fish in the fall. In this way, these families ate salted cod fish or salted caplin even in the winter months. Fish was supplemented with an occasional animal killed in the summer and vegetables grown in the garden.

Cod fish continued to be an important meal to Newfoundland families in fishing communities after the decline of the salt fishery and has been important in terms of economics at the household level. As one woman put it, she was "brought up on fish." Fish was inexpensive in that it was

caught by a family member for personal consumption and it increased the nutritional value of family meals. With the current cod moratorium, people do not have as easy access to the resource. One woman said, "I mean fish now is like gold around here right." Even though they can still buy fish in stores, it is often too expensive in comparison to other meat products, especially when living on a fixed income.

7.2 Eating patterns

Whether or not a family ate all of the parts of the fish and what they considered to be discards varied from family to family and amongst family members. Families engaged in the salt fishery usually ate or used all of the parts of the fish. Any part of the cod or caplin that was not eaten, women spread on the garden for fertilizer. Cods' heads were used on turnip, and caplin on other vegetables. When fish was salted only the fins and the tail were discarded.

Some of the younger women said they ate every part of a fish including cods' heads, tongues, britches and so forth, while other women were more selective in which parts they would and would not eat. It was a rarity for younger women to discuss discards from fish in terms of fertilizer in gardens. However, it is apparent that some households, perhaps older

households, continue the tradition of using the discards from fish as fertilizer.

Some eating patterns were seasonal. For example, some families boiled the sound from the sound bone or ate the britches or puddocks[32] in the fall of the year. During the fall these parts were hard and stiff. In the summer the sound and other parts were softer. Some of the women's husbands would purposely choose a black cod fish for meals at home. These eating patterns and knowledge about the particularities of fish as food were more common among older than younger women[33]. Some women fish makers said that only the best salted fish was eaten by their family for meals; while others insisted that all fish was good once salted. It appears some families engaged in the salt fishery ate the fish that were cracked by the sun and those that would not get the best grade at the cull. These families may have done this because of the importance of the cull to the family's quality of life during the winter.

A trend seemed to develop in my interviews in that each woman discussed eating and liking fish in relation to their husband's and father's eating habits. This was true of both the older and younger women. A younger plant worker said: "I

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[32] The stomach.
[33] In this text, older women include women who worked in the salt fishery and retired workers.

mean my father is a lover of fish and therefore we're all lovers of fish." If their father ate fish, then the family ate fish. If a woman's husband ate fish, prepared in a particular way, then his wife prepared the fish this way for meals, even if this meant abandoning meal preparation techniques that her mother had taught her. It appears that ways of preparing fish as meals were passed down through the generations in a patrilineal fashion. One woman mentioned that her mother prepared fish with gravy but because her husband and his family did not eat fish like this she did not prepare or eat that particular meal. Rather, she adopted her mother-in-law's ways of preparing fish. Another woman informed me that her husband's family ate parts of the fish that her family discarded, such as the britches and the puddocks. Both older and younger women also mentioned that they did not like fish as much as their husbands or fathers. When women left the flakes to work in the plant they did not cook meals as often, especially fish meals, because they were not home as much at meal time. Women often prepared and preserved fish either in the freezer or by salting. As one woman put it: "... without a bit of fish ... our deep freeze be empty." Some husbands salted fish for personal consumption since the decline of the salt fishery. However, salting seems to be declining amongst younger women and younger families.

7.3 To buy or not to buy?

Families who engaged in the salt fishery usually got fish for family consumption from their husbands, who were fishers. If their husbands could no longer fish due to an extenuating circumstance such as illness, then the family might buy fish from the plant if they could not get it elsewhere.

Most families continued to get their fish from a fisher, usually a husband, father or brother if they could until the moratorium. If women had no family member who fished they often bought fish at the fish plant for family consumption. Most fishing families did not need an opportunity to buy fish from the plant because they had their own fish and the fish at the plant, of course, costs money. Some fishers caught fish for their family using hook and line and not the regular gear such as traps or gill nets that they used to harvest fish to sell to the plant. One woman mentioned that she usually got fish from a fisher on the local wharf. However, this became increasingly difficult to do over the years because fishers needed to sell their entire catch to the plant because they were experiencing increased difficulty qualifying for unemployment insurance benefits. When fish was plentiful, fishers gave away fish. Getting fish was never a problem.

7.4 Plant fish vs. fresh fish

In general, the wives of fishers preferred to eat fish caught by their husbands rather than fish purchased at the fish plant. Many women plant workers preferred a cod fish that was just taken from the water as opposed to fish bought at the store or at the plant. Fish from the plant did not seem to be as good quality because it was processed. They attributed the differences between fresh fish purchased directly from a fisher and fish that went through the plant to the freezing techniques and chemicals used at the plant. Fished smelled odd because of chemicals used in processing. Some women perceived differences in taste and texture in the fresh fish from a fisher and that which was processed at the plant. Fresh round fish was generally considered to be better quality because it was not handled as much as fish that went through the plant and because no chemicals were added. In addition when fish is frozen at the plant it becomes tougher and drier. Others thought that fish lost its texture because of handling at the plant by workers and machines:

> ... if I could have got a fresh one right out of the water I dare say I would have got it right, but like the fish that I bought at the plant, it was good fish.

Nevertheless, women stated that the plant fish was good quality fish and they often bought it for meals at home. Some even bragged that the fish produced in "their" plant was the best around. Some of the women did not think the quality of the fish processed at the plant was any different from that of the fish provided by a fisher. As one woman put it, "I didn't even think in them terms." However, a woman who had both made fish and worked at a fish plant during her life believed that the quality of the fish processed at the fish plant increased over the years because of changes in equipment and techniques. For example, workers no longer use prongs to move the fish in the plant. She also mentioned that because the fish goes through the plant faster with the new machinery, the quality of the fish is better. The plants implemented quality control measures in which the workers had confidence.

Some of the women plant workers said that they would not buy particular products at the plant, such as minced products, because of how they were handled and the process they went through. Some women did not eat, buy or prepare much fish because neither they nor their children liked it. Others mentioned that they might buy nuggets and other types of battered fish at the plant because their children liked fish in that form. Some of the women chose to buy fish already cut at the plant because it meant less work for them at home

preparing the meals. Many women preferred inshore fish to offshore fish because an inshore fish had a firm texture whereas offshore fish had a soft texture in part because it lay around in trawlers for up to two weeks.

7.5 Quality of fish

Women fish makers said that skin colour was an important indicator of quality of fish. A black skinned cod fish was the preferred fish for meals, as opposed to a lighter skinned fish. A dark skinned fish was considered to be the best quality, dry and thick.

Concerns about quality may be possible indicators of ecological awareness. Some women plant workers were concerned about treating fish and crab as food, especially in relation to the incentive system. However, many women said that they did not eat much fish while they worked at the fish processing plant and some were offended by what they perceived as mistreatment in the processing of food, such as the handling of the fish and the machines' impact on quality. In general, when women starting working at the plant they cooked less because they had less time to cook meals. Women especially cooked less fish because they worked with fish all day long.

7.6 Changes in quality, products and species over time

Most of the women with whom I spoke all ate and liked fish. In general, older women felt the quality of today's fish was lower than that they had eaten in the past. The fish today is both smaller and thinner. One woman linked this to wider ecological problems, such as polluted oceans. Another woman made an interesting point when she noted that more people may be reaping the nutritional benefits of fish today because people can eat fish in a variety of ways and in the form of many products, as opposed to traditional ways of preparing fish. Older women commented that their families did not eat the same species in the past as families today. One woman explained that fishers would not harvest crab and other species of fish because they did not think it was edible.

7.7 Changes in meals since the moratorium

Most of the women plant workers I spoke with agreed that they do not eat as much fish now as they did in the past because there is simply none around to get. However, many of these women admitted that they still eat fish regularly

because they have preserved cod fish from the food fishery[34] but they felt that their supply of fish would soon run out: "We never thought about that, that we wouldn't see any fish." This is reflected in Table 1. We can see from the table that 10 out of the 23 women respondents ate less fish as an adult than as a child, while 13 of the respondents ate the same number of meals or more.

Many of the women I spoke with said that they were not eating any more meat products since the moratorium in part because many still had fish left from the food fishery. However, others said that they have increased the amount of meat they actually buy at the store. Women who had engaged in the salt fishery said that the major change in their eating patterns in recent years is that they buy most of their food now, whereas one time families produced much of their own food. In general people eat more store-bought meat as opposed to wild meat today. Faced with the fisheries crisis, most see a time when they will have to buy fish to eat and others have already bought fish from trucks or the plant. One woman said that having to buy fish angered her husband, who is now a retired fisher.

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[34] There is a current ban on the food fishery -- fishing for personal consumption.

7.8 Conclusion

Those families who relied on the inshore family-based operation during the salt fishery could not have survived without fish in their diets. It provided a staple food and sustenance for their gardens. Women's work in the inshore salt fishery was especially important in terms of reproducing the household. In terms of meals, fresh and preserved cod fish was an inexpensive nutritional source which women prepared and processed on shore. In terms of subsistence activities, women were the ones to use fish parts for fertilizer in gardens which provided additional food for the families. In addition to their processing work, these women worked in direct contact with their natural environment, using fish as food and fertilizer, as opposed to plant workers, whose relationship with their environment is mediated through technology and managerial strategies. Development schemes and "modernization" removed women and men from the ocean and land resources that provided sustenance and income (Antler and Faris, 1979; Wright, 1995a, 1995b). Because women are traditionally the preparers of food in their homes, concerns about nutrition might have a gender dimension, just as the sexual division of labour in paid work affects ecological knowledge. Most interesting is the patrilineal pattern of eating fish in

families that persists today. In addition, women possess considerable knowledge about fish preparation and fish quality which has been important for the successful reproduction of the household. Women salt makers' knowledge directly affected the final product, while plant workers' knowledge is largely constrained by the assembly line and managerial strategies and, in this way, of marginal significance to the product. However, women plant workers, preparing fish at home, draw on their own definitions of quality and nutrition.

The fresh\frozen fish industry and fisheries management have robbed people of traditional productive and reproductive abilities and increased the likelihood of food shortages. Fish remained an important source of food and income for families after the decline of the salt fishery. An analysis of the eating patterns over time of women processing workers have revealed some of the consequences of capitalism. Women linked ecological degradation to declining nutrition at the household level. The fishing industry and its management as currently constructed have facilitated the collapse of the ground fishery which in turn has meant a decrease in the income of families dependent on the fishery and in fish for food.

TABLE 1

NUMBER OF MEALS OF FISH EATEN IN THE HOUSEHOLD AS REPORTED BY WOMEN RESPONDENTS

RESPONDENT #	AS CHILD	AS ADULT	AT PRESENT
1	EVERY DAY	EVERY DAY	< EVERY DAY
2	2 PER WEEK	2 PER WEEK	< 2 PER WEEK
3	EVERY DAY	EVERY DAY	1 PER WEEK
4	2 PER WEEK	< 2 PER WEEK	< 2 PER WEEK
5	2 PER WEEK	1 PER WEEK	< 1 PER WEEK
6	1 OR 2 PER WEEK	1 OR 2 PER WEEK	< 1 PER WEEK
7	1 OR 2 PER WEEK	1 PER WEEK	< 1 PER WEEK
8	1 PER WEEK	< 1 PER WEEK	< 1 PER WEEK
9	2 PER WEEK	2 PER WEEK	2 PER WEEK
10	3 PER WEEK	3 PER WEEK	1 PER WEEK
11	< 1 PER WEEK	1 PER WEEK	< 1 PER WEEK
12	> 1 PER WEEK	< 1 PER WEEK	< 1 PER WEEK
13	< 3 PER MONTH	3 PER MONTH	< 3 PER MONTH
14	2 PER WEEK	1 PER WEEK	< 1 PER WEEK
15	3 PER WEEK	2 OR 3 PER WEEK	1 EVERY 2 WK
16	2 PER WEEK	1 PER WEEK	1 PER WEEK
17	1 PER WEEK	1 EVERY 2 WK	< 1 EVERY 2 WK
18	2 PER WEEK	2 PER WEEK	< 2 PER WEEK
19	1 OR 2 PER WEEK	1 PER WEEK	1 PER WEEK
20	1 PER WEEK	2 OR 3 PER WEEK	1 PER WEEK
21	3 PER WEEK	3 PER WEEK	< 3 PER WEEK
22	1 PER MONTH	1 OR 2 PER WEEK	3 PER WEEK
23	3 OR 4 PER WEEK	2 PER WEEK	1 PER WEEK

CHAPTER EIGHT: INTEGRATING GENDER AND THE ENVIRONMENT

8.1 Introduction

It seems that women in fishing communities are very much aware of ecological change and that their definitions of quality, changes in their work and changes they notice in the raw material are all indicators of ecological awareness. Women's labour process is different from that of men, especially considering the sexual division of labour in fish processing plants, in the family-based operation of making fish and in the household. Like men, women's ecological knowledge is influenced and defined by their "direct experience of a labour process" in particular and local settings (Kloppenburg, 1991:528). This must be extended to include their domestic and caring labour. Thus, women fish processing workers relate to raw material not only as paid workers, but also as mothers, wives, and preparers of food (Shiva, 1989; Gerrard, 1995). It is important to recognize that some knowledge systems may be less distorted than others (Harding, 1991) and that it is necessary to gather the perspectives of as many groups as possible to get a more holistic, overall understanding of our ecosystems and fisheries.

8.2 Factors that shape women's knowledge

The social context particular to women fish processing workers and women who made fish influence how they construct knowledge. My research suggests that factors that shape the local ecological knowledge of fish processing workers include age, whether they work in an inshore or an offshore plant, management strategies (for example, whether or not there is an incentive system), length of employment at the plant, the particular job or jobs they have held at the plant, and household or spousal relations (for example, female plant workers who are married to fishers versus plant workers or those who work outside the fishery). These factors influence their local knowledge but also produce barriers for transmission of such knowledge to policy makers (Felt, 1993). In addition, the patrilineal transmission of knowledge and gender and patriarchal ideologies may exclude women, who are the majority of plant workers, from certain types of knowledge (Neis, 1993).

Women who, in the past, "made fish" as part of the home-based economic venture and today work in the plant seem to have different perceptions of the health of the stocks than younger workers. Some women still believe that there is enough fish for fishers to harvest:

> See there's no one going to make me believe that there's no cod fish out there now. I mean there's cod fish out there because the foreigners are still out there taking it.

This woman's father was a trawlermen and her perceptions of the health of the cod stocks are quite different from most of the other women I spoke with.

8.3 Science vs. women's knowledge

Ecological knowledge has been the preserve of science, whose job it has been to study nature. In the case of fisheries science, this knowledge seemed less accessible to women in the fishery than to men. Because they work on land, and not on the water, women generally felt uncertain about their knowledge about the fishery and the adequacy of fisheries science. Many of the women I spoke with expressed some concern that I should be speaking with their husbands about the particularities of fish and the fishing industry as a whole. This pattern was particularly evident amongst older women. One older woman had who made fish was more willing to talk about her husband's involvement in the fishery and how the decline has affected her husband than about her ecological

knowledge and her experience: "Like I said I'm not a man. A man understands more about the fish." However, even younger women felt somewhat uncertain about their ability to answer some of my questions, especially when their husbands were volunteering opinions or correcting their wives' statements. Wives of fishermen seemed more confident than women workers who were not married to fishermen.

Women were critical of fisheries management but often not able to articulate clearly what they thought was wrong. Like fishers, their local ecological knowledge is not necessarily quantifiable or easily organized into existing models of science. They might also, however, based on their employment, identify symptoms of ecological problems that were quite different from those identified by fishers and others. Fisheries science and fishers' ecological knowledge, as currently constructed, seem to have a message for women plant workers that makes them feel they are not knowledgeable. Sometimes the husband of the interviewee stayed close by while I spoke to his wife and added to or corrected his wife's information. Some husbands, who also worked at the fish plant, insisted that they knew more about the plant than their wives. The body language of many of the women suggested that they were irritated with or intimidated by their husband's comments.

Most of the women I interviewed believed that fishers should have more input into the management and regulation of the fisheries. Fishers understand, through daily and life long experience, the dynamics of fish stocks. One woman commented: "The fishermen knows more about this than the government 'cause they're at it all their lifetime..." This was a typical comment. Most of these women, however, were rather uncertain about the need to include plant workers or the wives of fishers in discussions concerning fisheries management and regulation. Women questioned the value of the information that they could provide on such matters since they do not actually harvest the resource and do not control purchasing or processing.

> It was never up to a plant worker how much was brought in or how much should be brought in or taken whatever. It was always the management did that anyway right, at the plant; the plant workers had no say in it...

At the same time, women suggested or hinted that some fishers were not concerned about preservation and a few women adamantly believed they should be included in such discussions. After all, the state of the fishery directly affects the lives of plant workers and fishers depend on plant workers to process their fish for market and to raise and feed their children.

Among the women who worked at both the Bonavista and the Catalina plants, many did not anticipate the closure of their plants and the declaration of the moratorium despite observed changes in their hours, work, income, and the raw material. A typical response was:

> At the time [when] it [the fish plant] was shut down, for a while, we'd always say give the fish a chance to build up again now ... Took it for granted, I guess, that it was, you know, it [the fishery] was always going to be there.

According to one woman, FPI's prediction for the Catalina plant for 1992 was to operate for 48 weeks. When the moratorium was announced, it came as a surprise.

> ...we use to say that it wouldn't going to last the way the fish was coming in, I mean steady go all the time, right? ... But then again everybody was listening to the scientists 'cause the scientists was saying there was lots of fish out there and you knew that was their job, everybody believed it, right?

Women were uncertain whether or not declines in supplies of raw material were due to quota cuts or actual resource scarcities.

> like even though we knew I suppose deep down that it was eventually going to come, ... it seemed like instead of just flowing into the moratorium [it] just chopped right, all of a sudden, cut off.

These comments demonstrate a gap between FPI's perceptions or presentation of plans to workers and the workers' perceptions and what actually happened. This suggests a lack of communication between workers and management or deception on the part of management, and/or a failure of communication between scientific fisheries management and processing companies.

8.4 Women's roles and their knowledge

The ecological knowledge of plant workers may not be as holistic as the knowledge of the women who cured fish in the past and saw the fish go through every step of the processing procedure. Salt makers knowledge directly affected the final product, whereas the knowledge of processing workers who work in modern fish plants is mediated by the sexual division of labour, managerial strategies and property ownership. Salt makers worked in small-scale family-based units. This cohesion is lacking in the modern fishing industry in the second half of this century. However, getting the perspectives of all those involved with the fishery will provide a more holistic and less partial understanding of what is necessary to manage our fishery sustainably. We need to include the views of

women, who have been marginalized in the literature on the fishery.

Arguably, women in Newfoundland have not been excluded from fishery production. However, their relationship to production has changed in the post World War II period. With the onset of modernization and industrialism, the work process became mediated by technology (Merchant, 1980). Historically, women in Newfoundland did not "manage" the ocean resource. However, they managed gardens and other subsistence activities that depended on the ocean resource in the form of caplin and perhaps other fish offal and fertilizer. They also managed households, ate fish and depended on its sale. More recently, they have been affected by resource decline. They and their husbands have lost fisheries related jobs in the processing and harvesting sectors.

Women have some understanding about household incomes and household investments. In this way, they may understand the interconnectedness of daily sustenance and their environment so that, although they may have been hesitant to express their opinions, they may have tried to persuade husbands to take particular actions so as to influence their situation. What concerns do women express about protecting nature and the way they conceptualize nature? Do they use images and personification to describe nature? Do they appear

to share the mechanistic view of nature? What form does the mechanistic view take in the case of fisheries science? Are these women "vitalists", believing all life is sacred? Indeed literature has recorded that some fishers see cod as smart and sometimes refer to nature as an active and life-giving force (Neis, 1992). Based on my interviews with women processing workers, there seems to be a high level of concern about the environment and the fishery in particular. In addition, I believe that these concerns were conceptualized in a way that connects the local to the global situation. Instead of suggesting problems and solutions on a local level, most of these women recognized the interconnectedness of the world's ecosystems. Preliminary analysis seems to suggest at this point that women's location in communities/households might provide a basis for a more ecological versus mechanistic view of nature and society. They experience interconnectedness in their daily lives but this experience does not necessarily translate into a particular view of nature.

8.5 Managerial strategies

My work suggests that managerial strategies may have partly shaped how women approached processing fish. Women who had worked at the inshore plant, especially in the early

years, or on the flakes expressed concerns about "getting the fish done." Workers did not stretch out the work because processing the fish was top priority. According to one woman, when she worked at the Bonavista plant, it did not operate on Sunday. If the women did not get the fish processed Saturday night, they went to work on Sunday. It was better to work Sunday than to waste the fish. There seemed to be a respect for the fish as food:

> We got to work at the fish 'cause we ... can't throw it away and it's a bigger sin ... to throw it away ... and we got to work to put it away. So it was better to work than to throw it away.

Workers in the offshore Catalina plant generally agreed that the amount of fish that entered the plant had relatively little impact on the pace of work because people worked for the bonus pay and were not particularly interested in "getting the fish done." One worker said "if I knew that I only had to get me 100 I'd be just taking me time." However, some workers found the effects on the pace of work minimal, "people would still do an honest day's work." However, others related working speed to experience, "I guess after so many years of experience it just comes natural anyway right?"

Workers generally liked the incentive system at the Catalina plant because the bonus pay added substantially to

their weekly earnings and it made the day pass quicker when there was enough fish to keep work constant. In general, workers eventually became accustomed to the pace of work and most found it relatively easy to reach the minimums. Then again, if a worker could not reach management's requirements, she could lose her job and so would not work at the plant. At the same time, the work was hard and rushed. Many workers experienced extreme pressure every day trying to meet the minimum or acquire bonus pay. One woman explained, "... you had to work hard in order to gain anything out of the incentive system because the harder you worked the more money you earned." However, women pointed to the fact that it was a worker's decision whether or not to try to get bonus pay, and in that way workers had some control over their pace of work.

Women who reached top performance before the shift ended would slow down their pace substantially. Once a worker reached top performance, "well you were just doing for the company, which most of us did anyway, worked meself out of a job." Instead they might help a co-worker by putting their co-workers' numbers in the pans of fish that they processed. These pans of fish were tallied into the co-workers' work performance requirements. However, the company prohibited this type of activity and a worker was rarely in the position to offer such assistance. Of course this did not occur when raw

material was short. Tensions between the pressures to stretch work and the pressure to get a good bonus (collective versus individual goals) might have reflected underlying ecological changes or changes in raw material supply caused by overfishing. Workers preferred to help a co-worker rather than process more for the company in part because they feared that if they consistently performed better than the top requirements, management might conduct a time study and raise the requirements for the incentive system.

It appears that work sharing was uncommon at the Catalina plant mostly because work and fish were both plentiful. However, many women expressed a willingness to take a lay off if someone required work to qualify for unemployment insurance benefits. Work sharing and stretching out work seemed almost impossible because the incentive system individualized work: "... everybody was working for their incentive so like there was no way of stretching it out, what was there was there, and what wasn't there wasn't."

Women found it difficult to secure bonuses for many reasons. When the fish entering the plant was good quality, workers had to produce more to get the minimum requirements. Seasonal workers sometimes found it difficult to meet the requirements. They sometimes found it more difficult to become accustomed to the pace again. Plant work is boring and

monotonous, sometimes discouraging concentration on the task at hand. Age and length of time at the plant affect a worker's performance because of work-related injuries acquired over the years (Neis and Williams, 1993). Women complained about difficulties in distinguishing between bones and ice when fish entered the plant frozen. The plant was cold, especially during winter months, making the work particularly trying. One woman explained that in the last couple of years workers found meeting top performance increasingly demanding because the company had raised the standards. Making bonus also depended on the size of the fish and a worker's position at the plant. Scrappy fish or fish with a soft texture and the amount of fish entering the plant in part determined if a worker could meet the requirements. All of these difficulties were exacerbated when workers tried to meet managerial demands in the face of resource shortages and reduced quality of raw material. These added to the stress experienced by these workers.

Some of the women at the Bonavista fish plant did not want an incentive system introduced. They worried about having to increase their pace of work, the work becoming harder, and the impact it would have on the quality of the products. Workers also voiced concerns about an increase in managerial

monitoring. Some wanted to avoid increased competition amongst workers and had heard Catalina plant workers complain about the incentive system. Worker opposition and the fact that the plant was always seasonal in operation (and hence management felt an incentive system was not feasible) were two reasons workers offered as to why the management at the Bonavista plant did not implement an incentive system. One woman would have liked to have an incentive system because she regularly met and sometimes passed the minimum performance requirements and would have liked to earn the extra money.

> No because, I mean, you know I've never, I've never worked in a plant where they had that, right? Now we did have it in the fish plant but I mean we didn't get paid any more for like, whatever, like in the Catalina plant they did that ... I don't think I would want that, you know. They would reach what they were supposed to do, you know. They could feel that they didn't want to work, but I mean they had their work done for the day. So I don't think I would want that, if I just work at a steady pace and keep doing what I was doing you know.

Work sharing occurred at the Bonavista crab plant. In order to qualify for stamps the foremen might ask workers who already had their stamps to take a layoff to allow another worker to qualify for unemployment insurance benefits. "I always took my layoff for somebody else to get their stamps." Some workers said that they did not try to stretch out the work because they respected the company. Others spoke about

stretching out work. In the last couple of years it seems that none of the crab plant workers I interviewed were able to qualify for unemployment insurance so there was no job sharing. Even the more senior workers experienced increased difficulty qualifying for UI.

It appears that the work environment was more relaxed in the crab plant than the fish plant:

> Yeah at one point you know I think we did (have to reach a certain performance) but we don't bother to any more because we've been told that we, we're up to standard, we're doing what we're supposed to be doing and unlike the fish processing we weren't under a lot of pressure in the crab plant.

Some plant workers who had worked at both the Catalina and the Bonavista plants described the pace of work in the latter as much slower than in the former:

> In Bonavista, they have no incentive, right? I can remember coming home and saying ... to X how do they do it down there? They don't work, you know to me I thought, it's not that they didn't work obviously or, the plant wouldn't be open if people didn't work, but I was so used to everybody working like I worked or you know you got into that little mode, no one spoke to anyone because well we'll get our incentive and then we'll go out to the washroom and we'll have our little chat or smoke for some people right, or a glass of coke or whatever it was, right? So everybody went in and put their head down and worked, whereas down here it was more relaxed ... So I think I preferred the work with the incentive or maybe I ... just got accustomed to working that way. Like I said, when I went down here you know I found it kind of strange that

> people were just, you know, chatting and ... it was much more relaxed.

Workers still had to meet managerial requirements at the crab plant and do quality work. According to one worker, each shift was trying to surpass the other, all in the name of fun. Was this encouraged by management? It is hard to say. It appears that although management did not introduce a formal incentive system, management did encourage fast and quality work through praise, "Well the more you got the better praises you got."

Sometimes workers' performance *was* monitored. This depended on the individual foreman. However, it appears that in the last four or five years of operation the workers were not monitored unless an individual worker abused the rules, such as taking unnecessary washroom breaks, or talking to co-workers and interfering with worker performance:

> No, I mean we did our own things and the supervisors, they didn't know what we were doing anyways, half the time. You know, they look at us and say "What are you doing now?" I mean once you show them how to do something it's up to us. The management said we are the people that know what we're doing in the plant, right?

Most of these women felt that management treated both the men and women plant workers equally. Individual foremen sometimes showed favouritism to male friends. One woman explained that there are obvious plant jobs that a woman would

find difficult because of the physical demands. Nonetheless, sometimes foremen used this as an excuse to choose a male friend instead of the woman who was next in line for a particular job that either a woman or man was capable of doing. A woman had to question a foreman's decision sometimes when she was overlooked for particular jobs that either a man or woman was capable of doing.

In sum, managerial strategies affect women's work experiences and their knowledge about their environment. Different strategies, such as strategies that encourage individualized as opposed to collective goals, influence women's perceptions differently. Women's goals and knowledge are influenced by organizational goals and contexts.

8.6 Plant workers' knowledge vs. fishers' knowledge

The understandings of plant workers may differ somewhat from those of fishers and plant workers themselves do not all agree. If so, this has implications for policy making. As Felt (1993) has shown, we must understand the social processes through which people construct knowledge to determine the utility and accuracy of such knowledge. How might fishers respond to plant workers' local knowledge? Would they see it as a legitimate form of knowledge? Based on the dynamics

between husband and wife that I saw during my interviews, it seems that women's local ecological knowledge will meet resistance by both male fishers and plant workers. Is the knowledge of plant workers influenced by fishers, or is their knowledge confined to the knowledge transmitted through the technology of, and the relations within the plant? My analysis has shown that women do not acquire knowledge in isolation from their husbands, fathers or sons. It is necessary to consider the points of view of plant workers versus management. As well, perhaps one's particular role or occupation in the plant limits or alters one's ecological knowledge. An investigation into the process and context of how plant workers acquire knowledge, combined with the information retrieved on fishers TEK, will provide some insights as to the extent of and reasons for differing opinions concerning the health of the ecosystem and resource, and highlight barriers to sustainable fishers.

8.7 Women's work -- A household strategy

The single enterprise town context of these communities seems to shape workers' perceptions of the environment or at least what they will say about their work (McFarland, 1980). The fish processing plants were the major sources of

employment in these communities. Thus, workers may have feared managerial reprimands if they spoke up concerning their own observations about the health of the stocks. In this way, women's decision to keep quiet about any ecological concerns may be based on their immediate concerns about reproducing and supporting their households. One woman believed that plant workers might be seen as having played a role in resource degradation because they saw changes in the amount of fish and raw material, but did not speak up. Silence on this, however, is rational in the context of these communities where there are little or no alternative means of employment. The plant provided workers with what they considered to be "good money" for their labour, especially in comparison to the other limited employment opportunities in their communities, especially for women, and particularly for those with low levels of education.

> I think I knew it was in trouble, but like a lot of people who didn't really know what to do about it and like everyone who kind of feared, like ... every time ... I hear people say this about Ottawa mismanaged the fish, I know to a certain extent we were just as much to blame because I saw what was happening ... I don't know if it was ever really talked about, but I'm sure if I saw, a lot of other people saw what was happening, but still we either didn't know what to do about it or we didn't want to do anything about it because we didn't want to accept it, you know? ... It takes a pretty, you know, a pretty tough person to stand up and say, well, 'I don't care, I don't mind my job being

> lost. I don't want the fish stocks depleted'. You know, who's going to stand up and say that?

In this way, their behaviour and decisions may have been influenced by economics and immediate need at the household level. Women's decisions to work at the plant were largely limited by their child care responsibilities. Women usually went to work only when they had arranged suitable alternative child care, such as having an older daughter or mother to care for the younger children. Many women regarded the plant as the most accommodating employer in terms of child care. Sometimes, if both wife and husband worked at the plant, they worked opposite shifts for the purposes of child care. One woman with whom I spoke explained that her husband worked in the Bonavista plant during the summer and she worked at the Catalina plant during the winter in order to accommodate child care needs by always having one parent at home: "As a mother I always wanted to put the kids first." I do not mean here that men played an equal role in child care because for the most part they did not (Porter, 1993). Many women found work at the plant very difficult because they had another day's work at home in terms of child care and domestic duties (Omosa, 1992; Sunny, 1992; Mackenzie, 1993). One woman describes "getting on" at the plant:

> Yeah I got out and I said I was going to get out to work you know. Well my, the youngest girl, I think, I don't know if she was four or she was five. Maybe she was older than that, and I had other girls was old enough to look after her. So finally, I just said, well, I'm going to go to work. So, I marches up to the plant and puts my name down and that was sometime in April. Maybe, like I said, around the sixth or the seventh of April that year and a couple days they called me, just like that.

Women who worked at the Bonavista and Catalina fish plants offered a number of reasons why they "chose" to work in the processing sector. Their other roles placed limits on women's options, and their decision to work outside of the home was often part of a household strategy. Women stated that the fish plant provided an opportunity to make their own money for their children and themselves. Fish processing plants were the major employers in the area and offered the best money in comparison to other labour jobs especially when considering families could remain in their own home town in rural Newfoundland. Getting one's stamps seemed to provide a huge motivation to procure work at the plant. Some women said that they had little chance of working anywhere else because they had little education. Other women, especially younger women with a high school education and\or a trade, could not find work in their area of training and when they did, these jobs did not offer as much money. An interesting point that many

made was that working at the plant was not a choice as such, but something into which a lot of people simply fell:

> This was a fishing community right, most everyone, that was the main thing in Bonavista, fishery, that's all was here, right? You go up in the harbour, the harbour be right filled up with boats and longliners ...

Families often worked at the plant: "You'll find that in the plant there's a lot of families in there ... there's not a lot of jobs for people like, say, outsiders."

Some women enjoyed the seasonal nature of the work at the Bonavista plant because it offered some sort of economic independence while also allowing time to perform seasonal household duties and allowing them to hire a local girl to babysit during the summer months. Women usually spoke about preferring either day shift or night shift in terms of child caring and domestic responsibilities. One woman explained: "It's harder you know for a woman ... than for a man 'cause I mean 'cause you got to get up and then do another day's work before you go back to work again."

8.8 Work contentment

Women at the Catalina and Bonavista plants offered mixed assessments of their contentment at work. Some workers did not enjoy the work at the plant and it was the pay check, especially if the job paid incentive, that made it worthwhile.

> ... Well, when I was younger, it wasn't so bad, I mean I had a pay check coming in every other week ... but when I got older and got married, I mean there was times I'd get up in the morning and I'd wish I had a job that I liked to go to, right, but there wouldn't. I can't say it was all that bad.

Younger women, especially those with trades, did not enjoy plant work. Plant work is physically demanding: "there wasn't one day I really liked going to work." Other women enjoyed plant work and the opportunity it provided for socializing: "You didn't realize ... the interaction or the social benefits that you got from working until it's gone." These women were accustomed to the work, "it's the only job that I know," and took pride in their workmanship. These women have missed their work and co-workers greatly since the plant closed. The plant was a place of social interaction outside the home for these women in a context where there is little other opportunity and little spare time for socializing because of child care responsibilities. Since the moratorium, most women only see these friends when they are out shopping at the local store or

running other errands outside the home. Women who have started doing different things, such as retraining, find they have little in common with co-workers any more.

According to one worker, it seemed that people had more time to talk in the last few years at the plant because work was slower. As the composition of fish changed and work slowed, workers grew concerned about being reprimanded more frequently for not meeting the performance requirements. The incentive system divided workers and impeded communication between workers. Those who worked on incentive paying jobs were less eager to talk than those who did not work for bonus pay. Communication between workers also depended on where in the plant one worked and how the lines were set up. Some lines were especially noisy and set up in a way that discouraged chatting.

8.9 TAGS vs. UI

Some of the women I spoke with who were presently on TAGS also worked at the crab plant to try to qualify for unemployment insurance. They felt better about collecting UI than TAGS: "at least you say I'm working." Before the moratorium, if crab workers did not work enough weeks to qualify for unemployment insurance benefits, then they could

turn to the fish plant for a few weeks to get their stamps. An important source of supplementary work has disappeared for the crab workers.

Some fish plant workers went to work at the crab plant after the fish plants closed. One worker explained that she felt tremendous social pressure at the crab plant to take a lay off, to give somebody else a chance to qualify for unemployment insurance, since she had already worked enough weeks to qualify for unemployment insurance. These fish plant workers usually took work at the crab plant, even when they would not get their stamps, because it was an opportunity to get out of the house, a chance to earn a little extra money, and some feared declining an offer of work would result in their being cut from the TAGS program. However, these workers gained little financially by doing this because of extra expenditures such as travel costs and lunches. One woman told me that she made $8.72 per week more than she would have if she had stayed at home and collected her TAGS check.

The compensation packages issued by the government in response to the moratorium have created a lot of tension between groups of people and have divided people in these communities. Plant workers are pitted against fishers; fisheries workers in general against non-fisheries related workers. People who work outside the fishery resent the fact

that fisheries workers are getting "free" money. Plant workers believe fishers are better cared for than plant workers. One woman said: "Fishermen is getting the better end of the stick ... fish plant workers is dirt, treated like dirt as far as I'm concerned." One woman noted that the media portrayed fishers as the ones hurt by the fisheries crisis, while giving plant workers little coverage.

Under both the TAGS and NCARP programs, women were more likely than men to collect the minimum payments and women's incomes were reduced more than men's when TAGS replaced NCARP. These payments are based on past fishery-work earnings. Because plant workers earn less than fishers and female plant workers earn less than male plant workers, the sexual division of labour is perpetuated (Williams, 1996).

8.10 Competition amongst fishing communities

Tensions run deep, especially when communities compete for remaining fisheries resources. Women brought up the fact that there have been talks about moving the crab plant from Bonavista to the Catalina plant. Of course the Catalina workers thought it was a great idea, but the Bonavista workers did not want the plant to leave their community even if their jobs and seniority were guaranteed in the move. Would this be

an ecologically sound move? Processing crab at the Catalina plant might mean that even more crab could go through the plant, because of its size and modern equipment, in a shorter time. This might increase the difficulties workers experience qualifying for unemployment insurance. What would this mean for the women at the crab plant? It appears that there were very few men working at the Bonavista crab plant. With a scarcity of jobs, would this move from Bonavista to Catalina initiate a removal of women from the plant and more men moving into crab processing?

Women sometimes seemed hesitant to comment on quality, often insisting that *their* plant produced the best fish around. This may be because they took pride in their work, or that they feared repercussions for criticizing the plant and its products, especially in times of scarce employment opportunities. Competition between plants may also have prompted women to defend their plant, especially in the area where FPI is deciding which plant to shut down and which to keep open.

8.11 Children and the future

If women do not see a viable future in their community, especially for their children, they may not think in terms of

conservation. Most of the women voiced concerns about the future of their communities and the quality of their children's lives without a fishery. "[W]e'll miss the fishery... it's missed now isn't it?." "That was the backbone of this place." However, some of the women stated that they discouraged their sons and especially daughters from entering the fishery, encouraging them to get their education. It appears that younger people in fishing communities are not interested in traditional ways of life but I also suggest, from personal experience, that they have been discouraged from getting involved in those traditional ways. Most of the women with whom I spoke believe the cod fishery will make a come-back but never on the scale that it was. Some women fear that the crab fishery is headed in the same direction as the cod, especially in light of fishers shifting harvesting effort to crab and increased crab licences issued by the government.

8.12 The moratorium and uncertainty

The moratorium has changed the lives of these women. Financially, families have been hit hard. Women miss the social and psychological benefits they got from working at the plant. Women mentioned the overwhelming feeling of uncertainty in their lives and their families' lives. Most though, said

that they were better off than a lot of people around them. Those whose husbands were working, especially in a non-fisheries-related job, felt especially lucky. Many women mentioned the fact that many families are having problems, including splitting up, since the moratorium. Women also mentioned that now, with their husbands at home more often, they get on each others' nerves. Men have invaded traditional women's spaces. Some mentioned that they would try to suggest tasks for their husbands to do to keep them occupied:

> ... [Y]ou know like you got families that's fighting over this and well they says, when poverty comes in the door love goes out the window and you know something, it's true. It's true because when you were working, like especially if you had a man and wife you had the man on one shift and the wife on the other, because of babysitting reasons you always have somebody home that's the way it's set up right, and I mean they work in the plant 15 and 20 years like this and all of a sudden two of them are threw out of work and they're just getting on each others' nerves.

Some families, especially young families, have decided to pick up and leave because of the lack of employment opportunities in their communities. The moratorium has affected the work opportunities for those outside the fishery as well.

> [L]ike I said, ... once they finished school if they couldn't get anything else the plant was always there to kinda like to fall back on right? But now there's really nothing, if you don't want

> to work in a fast food place or a store you haven't got any more choices.

Another woman expressed concern about her children's future in a fishing community: "It kills me to move, I mean this is home right? But what can you do, there's no future here for the kids, nothing right?"

Some families who own their own homes do not see the point in moving. One woman pointed to the fact that if worse comes to worse at least you can live off the land in rural Newfoundland. Some of the women with whom I spoke like rural community life and do not want to leave it, or their families.

> I can't see it, I mean 'cause I don't even see the point in like me packing up and moving on. I mean, I got my home, I owns my own home and I mean my husband is 50 years old now. I mean, he's working but you just can't pack up and move and leave everything.

8.13 Retraining

Many women I spoke with had been or were involved in the retraining and upgrading opportunities for fisheries workers. Some thought that retraining programs were a great opportunity, especially for younger workers, to do something they had wanted but were never able to do. In general, older women did not want to be in school. Those who did go back to school usually did upgrading and realised that it would not

help much in terms of competing with educated and younger people in the work force. Some women considered some of the programs to be a waste of time and money, especially when funds for TAGS were being cut. In addition, many of these programs are designed with the assumption that women are unskilled workers, perpetuating negative stereotypes. Some particular programs were criticized because they had no impact on employment opportunities. Some of the women thought the funds for retraining programs could have been better spent if their designers had consulted with the people for whom the programs were intended. This includes recognizing that women fisheries workers may have different interests from male fisheries workers (Robinson, 1995; Davis, 1995). Many women in these programs said they would have preferred more access to Adult Basic Education programs instead of the money being pumped into programs that did little in terms of making people more employable:

> But you know ... we had another program here a few months ago ... yeah, that was ... a lot better than "Improving Your Odds". The reason why, we had people involved in the industry that sat down with those people and said look this is what we want. We want programs. Those are the people we want there doing those programs, ... and if workers had some, had representation there they'd have some input in choosing what you have ... That program went very well.
>
> Because what they were teaching us was all about the ground fishery and the draggers and stuff like

> that. I mean, why would we be interested as women in that you know? The only thing I found we got out of it was, well, we had health and safety and we all needed that, but I mean we got first aid. That's the only thing I found out of it.

Most of the women I spoke with felt forced to retrain or enroll in some type of educational program in order to ensure they would not be cut from the TAGS program. One woman said, "[T]hey said it's up to you, but I mean you got no choice really, they're forcing you I think." These women feared the repercussions of not being defined as "active" by policy makers.

Women's retraining options are limited because of their domestic and child care duties. Women cannot easily leave the community to do a program even if it is something they have wanted to do, because of household and family responsibilities. In the meantime, husbands often left the communities for months at a time to retrain and look for work in another area of the province or outside Newfoundland, leaving women to bear the entire burden at home. When I asked one woman how she felt about being left at home a lot while her husband went away to work she said "you know you gets used to it, when you marry a man who loves the water yeah."

Some retraining programs have been designed without adequate research into actual employment opportunities. For

example the government has offered programs in areas where there are already a glut of trained people, such as cosmetology.

> ...Like, I think, ... before you should put people into training you should look at what are their opportunities of getting a job after the training is done...

8.14 Causes of fisheries degradation

Women offered a variety of reasons to explain why the fishery is in the shape it is today. Women base their conclusions on their experiences in their paid and unpaid work, community life, discussions with fishers, friends and family, contact with government representatives and the media. Most of the inshore plant workers and salt makers blamed the technology and offshore fishery and, in particular, draggers, fishing year round including during the spawning season, and dragging the spawning grounds. Offshore plant workers, recognizing these problems, tended to defend the offshore fishery. Many also voiced concerns about the amount of fish that seals eat. Most agreed that overfishing, both local and foreign, were primarily responsible for the collapse of the Northern Cod stocks. They blamed the government and scientists for mismanagement and not recognizing fishers' ecological

knowledge. Others felt uncertain about the role of scientists and the government in fisheries management. Greed and a market driven, rather than preservationist, industry were other suggested explanations.

> I have to blame the government. If you got to point a finger, right, especially the scientists coming out and talking about all this fish and when there was a lot of fish there, Lord Jes' we were giving out permits. The government was putting plants on every little crook and corner on the island. Right, stamp factories that's what it was, you work 10, 12 weeks and like I said, they put plants everywhere because it was lots of fish right. But ah it's gone now...

8.15 Violence towards nature -- violence towards women

Bringing technology and machines into a community, i.e. a processing plant, affects a variety of things. These machines determine what is and is not fish, what is and is not waste, and these definitions change over time. Machines affect how local people look at the environment. Technology helps fishers continue to get high catches, despite declining stocks, marginalizing nature's role in the reproduction of itself and its natural patterns. Technology is applied science. Technological change has different implications for men and women in fishing households. This may, in turn, affect

their perceptions and knowledge about developments in the fishery (Merchant, 1980).

Governmental policies concerning the fishery and fishery dependent households are gendered. Government policies might also bias their perceptions of what is happening, as well as colouring views on the resource and local nature. Indeed, their commitment to conservation might be influenced by their fears or perceptions concerning the repercussions of future policies for their employment. The decline of the salt fishery and gender ideology were encouraged by "modernization" and "rationalization" policies (Wright, 1995a). The Federal and Provincial governments tried to modernize an "inefficient" inshore fishery that relied heavily on women's participation in processing the fish. Premier Smallwood was recorded as saying that the absence of women and children from the stages was a sign of progress (Neis, 1993; Wright, 1995a). This was based on certain assumptions about the role of women. In this way, the dominant knowledge systems have been violent to nature and to women by depleting the fish as a resource and oppressing women through modernization and scientific schemes (Merchant, 1980; Shiva, 1989).

Processing plants were a part of the rational plan to modernize Newfoundland's fishery. Women have indicated areas of plant management and technologies that have promoted

unsustainable practices. Development schemes and fisheries policies have been informed by "rational" scientific approaches that have been violent towards nature and women -- violent in terms of environmental degradation, occupational health, unemployment, and uncertainty, especially in times of resource declines.

Women have been relatively uninvolved in shaping the directions of policies dealing with the present situation in Newfoundland. Women possess knowledge about the survival of families in outport Newfoundland and need to voice their ideas so that policy-makers can effectively deal with our fisheries crisis. Women must draw on their organizational skills, derived from their local organizations and as managers of households, and traditional activities and roles and put forth their ideas. Women's knowledge and efforts may have few immediate effects on the direction of policy, as was the case in Norway. This may be partly due to the fact that women's knowledge is different from the bureaucratic, scientific knowledge used by policy-makers. However, women need to legitimize their ideas and knowledge and challenge the power and prestige of dominant ways of knowing (Gerrard, 1995; Williams, 1996). Additional research must be done in this area so that we can gain a fuller understanding of the link between women and the environment.

8.16 Conclusion

The social constructivist and feminist theoretical perspectives indicate the importance of including women in the literature on ecological knowledge in order to avoid partial descriptions and interpretations of the environment. Working through the standpoint of women is useful in understanding women's knowledge and how they articulate it, as well as understanding how social institutions and ideologies work in their lives (Harding, 1991). Women's knowledge is a product of their daily experience and interaction with others and nature, and of the division of labour (Gerrard, 1995). Women's fisheries knowledge is shaped by their work experience and their dynamic roles in the household, at work, in the community and with government. Women's perceptions of the fishery reflect their embeddedness within their families and communities. This embeddedness caused them to experience contradictions between raw material supply, the organization of work, and the requirements of their families and communities. Understanding these relations mean more reliable interpretations and descriptions of the natural and social worlds.

Women processing workers transform raw materials into profitable commodities. Their jobs are located mid-way between

harvesting and marketing and their knowledge reflects this position. As my research has shown, women processing workers indicate tensions at the processing level, such as mismatches between raw material and technology, associated with resource decline. These women not only possess extensive ecological knowledge about fish ecology, but also about how capitalism, in this case, the fishing industry, responded to ecological crisis and how these responses affected workers, families and communities. They know about the quality of food and link fish ecology to the market place. Their knowledge indicates how capitalism and patriarchy respond to resource shortages. Women's processing work and knowledge are mediated by relationships of ownership, technologies and managerial strategies. These social relationships shape women's knowledge and link the social and natural worlds.

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APPENDIX I

ORIGINAL INTERVIEW SCHEDULE

INTRODUCTION

This study is part of a much larger project that is gathering fishers' ecological knowledge and studying the impact of the fishery crisis on health, communities, and education. My particular part of the project is looking at the way changes in fisheries affected the work and the families of fish processing workers -- in the past and in more recent years up to and including the moratorium.

PERSONAL BIOGRAPHY

When were you born? Where?
Where are you curently living?
Father's occupation? Mother's occupation?
Marital status? Spouse's occupation?
Number of children? Age of children? Children's occupation?
Formal education level?

WORK EXPERIENCE

How long has your family been involved in the fishery?
Husband's family? Where?
How old were you when you first started working with fish/crab? Where did you first start working with fish/crab?
Where have you worked with fish/crab? plant? in what communities? making fish?
When did you first start getting paid for this work?
What were the different jobs you held over your career?
Were there years when you didn't work with crab/fish? Why?
Are you still working for pay processing fish/crab? If no, when did you stop and why?

Was your mother,father etc. involved in the fishery/fish processing? How? Were you as a child involved in the fishery? In what way?

When did you marry? Did you move to a different community when you married? Is/was your husband a fisher?/plant worker? Did you continue to make fish/ work in the plant when married? In the same community?

MAKING FISH

When did you begin making fish? Who participated in the curing? What kind of fishing/curing operation was it? family/household salt fish operation? salt fish plant? How many people were at work in this operation? How were these fish being caught? Describe the operation and your job(s) within it (include meal prepararti on, child care, gardening, etc.)

I want you to talk about a season at the fishery when you were working in this operation.

When would the fish first begin to arrive? When would you start to work at it? What did you do? Did the fish change through the season? If so, when, how did it change and why? For each change: how did your work change? hours? had to watch more closely? turn it more? more salting? trap glut? change in the cure?

Change in where this fish came from? Where was it caught? How was it caught? Who brought it in? Did the crew working at the fish change? If so, when? Why?

What would this new fish be like at the beginning of the season? size, colour, fatness, thickness? (same? different?) How easy to split? quality, texture, etc.? How easy to keep? What type of cure did you make from it and why? -quality, weather, time? What did this fish look like after it was made? colour, hardness, smell (blackberry)?

How long would you work at the fish when you first started? good year and not so good year -- based on weather, fish availability, kids going back to school, etc?

Could you tell the fish caught early in the season from other fish caught later in the year? or from fish caught in different locations? or with different types of gear, eg. could you distinguish summer trap fish from summer trawl fish? summer handline fish? or fish caught on grounds further out? or summer fish from spring fish or fall fish? How would they be different?

Did the type of cure vary with the type of fish? with the time of year? How? Why? Could you get as high grade from the fish you worked with earlier in the season as you would from fish that came later in the season? Did the kind of fish caught affect the grade? Did the process of making fish mask

differences in caught fish of different times of the year and different places?

Was there much interaction between women working on the flakes/ salting the fish? Were children involved? boys? girls? men? Was there much interaction between fishermen and those who cured the fish? Only if you were married to a fisherman? Or father was a fisherman? If there was interaction, when did it happen and what was it about?

What cod livers would be used? For what purposes? Did livers change through the year in size, colour, texture? Over the years? Did certain fish have better liver for oil? Were larger livers better? How? Which?

Did your work at the fish start to change? amount of work, type of fish produced, time spent at it? If yes, why? - small children? family allowance? started to sell fresh? change in the fish, smaller? change in the gear? - small changes? big changes? Did you give up making salt fish? If yes, when and why? Did you start selling fresh to the plant? When? Why?

Did you notice a decline in landings? Shorter seasons? change in the weather? smaller fish? Did it take fishermen longer to bring in the fish, indicating they had trouble getting a good catch? How did you notice? Did your family have to start buying more gear?

Did changes in the gear that fishermen used and changes in the resource itself affect your work making salt fish?

PLANT WORK

When did you get involved in plant work? Why? How? Did you work at the plant when it opened? Did you take work immediately when it beame available? How did you get your job? What were you paid? What did you do? Who owned the plant?
Section working through career at the plant:
Describe the plant when you first started working there? size of the plant? different jobs? who did what jobs? species processed? products produced? technology? hours? number of days a week? shifts? length of season? Was the plant unionized?

Did the origin of the fish/crab change throughout the season? If so, how did this affect your work? hours of work? what you produced? how it was produced?

Did you tend to do the same job all of the time or did you move around? How much control did you have over your work? Was there much interaction or communication between workers and the owners and managers?

What was the pace of work? What influenced the pace of work? - pace of landing crab/fish? quota system? Did the time of yera affect your job? How? - type of fish? amount of fish? Was your individual production monitored? If so when did this start? Were you reprimanded for missing work? for your pace of work? initially? did this change?

Were plant workers eligible for UI when you first started? How many weeks did you need to be eligible? Were you generally able to get enough weeks? If so, how did this happen? there was enough work? there was a sharing of work? Were there years when you did not get enough work to qualify when you first started? If so, why didn't you get enough work? How certain were the hours? Were you paid if there was fish/crab to process?

How did you arrange child care? How did you deal with uncertain hours?

Was there much interaction between workers? Did you work with mostly women? men?

Changes in the plant: type, timing, reasons for changes, impact. describe changes? discuss how and why they happened? change in volume of fish/crab? type of fish/species processed? change in scale of production at plant? introduction of draggers? longliners? trucking? new offloading? processing technologies? - if new, describe.

If changes occurred, why do you think they occurred? company expanding? changes in raw material, shortage of fish/crab, smaller fish/crab? new markets? What do you think was happening?

For each change, how did these affect your work? hours?, nature of job, pace, supervision, comfort at the job, steadiness of work? Did the bringing in of new technology affect your job? How? (Examples: fish plant: cutting machines, individual work stations; crab: drum, saws, rollars, tip rollars, black light, different types of cookers?) If there were individual work stations, how did you feel about them? Why? - link to incentive and to possible competition for good fish?

Did you start getting a lot of overtime? Working more days? Did you start to try to stretch out your work? If yes, how and why? Did it become difficult to get the hours you needed? If yes, why? Did they begin to monitor production more closely? Describe.

Was an incentive system put in place? If so, when? Why in your opinion was it introduced? How did this work when it was first introduced (minimum quantity/quality?)? Did the monitoring/ incentive system change? If so how and, in your opinion, why?

When did the plant unionize? How? Why, in your opinion, did it unionize when it did? Were you involved in the unionization? How did unionization affect your work? income? production? pace? supervision? the gender division of labour? Before unionization, did you speak out about changes in income, hours? If not, why not? Did you fear it would affect your work, ie less hours, losing your job? Did this change with unionization?

Do you think the changes discussed above had anything to do with changes in the fishery resource? Explain. (resource decline and change, technological change). Changes in raw material - quantity, type, quality and impact on work?

Did you feel you had time to pay close attention to the work process and the particularities of fish? Were there times when you became more aware of changes -- because of effect on incentive, on how tired you felt, hours, work? Perhaps when it was difficult to make poundage due to smaller fish/crab?

FISH PLANT

What was the fish like when you first started at the plant? Did you notice changes in the quality and quantity of fish over time? If so, what did you associate these changes with? changes in stocks? in gear? changes in location fish caught? trucking? processing?

Where did the fish come from when you first started working there? Where was it caught? How was it caught? Who brought it in? (locally, trucked in from?) Did the origin of the fish change during the years you were at the plant? If yes, explain (vessel type, location caught, location landed?).

How did the introduction of longliners affect work at the plant? affect your own job(larger fish? different species? gluts?)? Did this affect hours and conditions of plant work?

Did this affect jobs (types/numbers)? Did this make it difficult to detect if there were changes in the stocks?

Did you process gillnet fish? If yes, when did this start? What was this fish like? compared to other fish? What impact did gillnets have on work at the plant?

Did you process dragger fish? If yes, when did this start? What was this fish like? compare to other fish? What impact did draggers have on work at the plant?

Did they start processing other species at some point? If so, when and why? Did you notice changes in the quantity, size, quality of cod around the time when plant started doing other species? Did you stop processing some species/products? If so, why? Did the market disappear? species disappear? Did they get too small for certain packs? Were large fish processed into particular products? Did the disappearance of large fish contribute to the elimination of specific products?

Was there more competition for fish? Did companies start trucking fish away? Did fishermen start selling to other companies? If so, how did this affect your work?

Was work reorganized in terms of the gendered division of labour? Did people move from job to job? Were women shifted to other types of work? If so, when did this happen? Why, in your opinion, did it happen? - as a result of economic change? technological change? changes in the resource?

Did they bring in new machines to process small fish when they realised that large fish were decreasing in number? Did they start processing fish they used to refuse (ie. small fish)? What used to happen to the fish they refused?

Did you notice a reduction in calls to work and in the length of the plant's operating season? When? Were there fewer night shifts? Were shifts cancelled abruptly, later starting times scheduled, shorter notices given? Did it become difficult to qualify for UI? Did the plant close earlier? When did you notice these changes?

CRAB PLANT

What was the crab like when you started at the plant? Did it change? If so, how? - abundance? size? colour? dirtiness? smell? texture? When? significance for your work -- hours of work, type of jobs?

Any technological changes? What were they? -- changes in discharge, butchering, cooking, saws, rollars, drum, shaker, blacklight, freezing, packing? When did changes occur? Did these changes seem to be associated with changes in the crab, ie. abundance? If yes, explain. If no, why do they think these were introduced?

When first started doing crab, were they processing fish? Did this change? If so, how and when? What significance did this have for your work?

Did they bring in new machines to process small crab when they realised that large crab were decreasing in number? Did they start processing crab they used to refuse? When? Why? Impact on your work?

Did you notice a reduction in calls to work and in the length of the plant's operating season? When? Were there less night shifts? Were shifts cancelled abruptly, later starting times scheduled, shorter notices given? Did it become difficult to qualify for UI? Did the plant close earlier? When did you notice these changes?

Was there more competition for crab? Did companies start trucking crab away? Did fishermen start selling to other companies? If so, how did this affect your work?

Was work reorganized in terms of the gendered division of labour, did people move from job to job? Were women shifted to other types of work? If so, when did this happen? Why, in your opinion, did it happen? As a result of economic change? technological change? change in the resource?

Were there times when you felt you were too busy to be concerned about the particularities of the crab you were working with?

USE AND WASTE OF FISH/CRAB

Do you like fish? certain types of fish? What types do you prefer? Are you eating the fish that you like? Or do you eat it even if you do not like it? If so, what species of fish do you eat? When do you eat them? How often do you eat them? -- on a daily basis? weekly? may be seasonal so during the season? how frequently? How many meals a day/week/month?

What parts of the fish were eaten? At any time of the year for any specific parts? Or only at particular times? Livers, spawn, heads, sounds? What was a good fillet?

Where do you get the fish you eat? Do you eat the fish that was processed at the plant? Why or why not? If no, where do you get it? What is the difference between the fish you eat and the fish processed at the plant? Did it look different? taste? How? What do you think of the fish/crab products produced at the plant?

If you do not get fish at the store or plant: Do you preserve fish for the winter -- frozen/salt? If so, do you prefer fish from a particular part of the season/gear, ie. fall? spring? trap? handline? Do you keep the best fish for yourself? Or would that be sold? Did fishermen, those who made fish, put aside the best fish to eat for themselves? Were fishermen more likely to bleed fish at sea to eat at home than to sell commercially? Do you eat the discards? Why? -- for economic reasons? There was no other fish to eat? When?

Did you eat more fish in the past? If so, how much? -- daily/weekly? If a change, why has the change occurred? When did it occur? Was it related to the declining stocks? the moratorium? changed quality? If a change, what significance has reduced access to fish or whatever had for your family budget? for the diet of your family? What do you eat instead of fish? -- birds, moose, chicken?

In the family fishery:
With the move from the home based salt fishery to salt fish plants, and later fresh fish plants, was there more waste? Was there a change in the nutritional value, quality of food?

For salt fish:
Quality of the fish? What causes "soft" fish? Poor quality fish? -- weather, exposure to the sun, gear types (eg. traps), larger catches, mistreatment at the salt fish plant? When making salt fish, what was "waste" from the fish? -- heads, guts, sizes, bycatch species, soft or spolied fish, maggoty? Did you eat heads? sounds? tongues? any other parts? What was generally done with the waste/discarded fish? Dumped? Garden? Animal feed? What parts?

Plant workers:
Truckers/those who worked on the wharf, receiving, unloading, gutting, filetting fish on the wharf -- did you see or practice discarding fish?

When you first started at the plant, was there much waste? If so, how much? What was wasted? Did wastage change over time? - increase? decrease? type of wastage? If so, why did these changes occur in your opinion? Did a shift in multiple-species based processing involve more waste? Can you think of some ways to reduce waste in fish processing?

What do you think affects the quality of fish produced? Can you influence the quality of the fish produced at your workplace? Can you think of some ways to improve the quality of fish produced in your plant?

LONG TERM QUESTIONS

How do you think we got to where we are today? How has the moratorium affected your life? the lives of your family members?
What do you think are the key problems in the industry? Did you think the fish stocks were in trouble? If yes, when did you start to think this and why? If yes, did you feel that there was anything you could do to stop the decline of the stocks? Did you do anything? Why? What do you believe caused the resource decline? draggers? gill nets? demand? poor management? cold water? Do you believe the resource was wrongly exploited? Do you connect other government policies (ie. resettlement) to fisheries policies and/or resource decline?

Should the industry be managed differently? Do you think the fishery can be managed/regulated by government/scientists? Is there a need for more input from fishers? Do you think plant workers, women have enough say in the management of the industry? Can you think of ways that they might have more say?

What do you think the future fishery will look like? Do you think that you will be a part of the industry? Husbands? Sons? Daughters?

APPENDIX II

MAP OF RESEARCH AREA